وزارة التعليم العالي والبحث العلمي

دليل الدراسة لكليات التقنية الطبية بالجامعات الليبية

2022م

قـــرار وزيـــر التعـليـم العالي والبحث العلمي
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بشـأن اعتماد دليل الدراسة لكليات التقنية الطبية بالجامعات الليبية

وزيـر التعليم العالي والبحث العلمي.

- بعـد الاطـلاع علـى الإعـلان الدسـتوري المؤقـت وتـعـديـلاتـه.
- وعلى الاتفـاق السياسـي الليبي الموقع في (17 ديسمبر 2015 ميلادي).
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- وعلى قرار مجلس وزراء حكومة الوحدة الوطنية رقم (39) لسنة 2021م بشأن اعتماد الهيكل التنظيمي وتحديد اختصاصات وزارة التعليم العالي والبحث العلمي وتنظيم جهازها الإداري.
- وعلى قرار اللجنة الشعبية العامة سابقاً رقم (501) لسنة 2010م بشأن إصدار لائحة تنظيم التعليم العالي وتعديلاته.
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قـــــرر

مـادة (1)

يتم بموجب أحكام هذا القرار اعتماد دليل الدراسة لكليات التقنية الطبية بالجامعات الليبية الرفق بهذا القرار.

مـادة (2)

يُعمل بهذا القـرار من تاريخ صـدوره وعلى الجهـات المعنيـة تنفيـذه.

عمران محمد القيب
وزير التعليم العالي والبحث العلمي

صدر في طرابلس
يوم الأحد
بتاريخ 4/12/2022م
ش.ق.ر.....

توطئة

الدول الحريصة على التعليم واكتساب المعرفة والخبرة اللازمة تعد أهم استثماراتها و ثرواتها ألا وهي عقول أبنائها . لهذا اقتضت المنهجية العلمية أن تطرح النتيجة التي جاءت بها والفكرة التي اهتدت إليها ومن ثم يتبعها التطبيق الكاشف عن دقائقها الموضح لجزئياتها. لهذا تم وضع هذا الدليل بشأن اللوائح التنظيمية لكليات التقنية الطبية بالجامعات الليبية والخطة الدراسية المعتمدة وفق توصيف المقررات الدراسية.

من هنا ينبغي العمل بهذا الدليل للرفع من النتاج العلمي بحثاً وتدريساً لشتى العلوم التقنية الطبية. ولأنها توطئة سنأخذها ونسعى إلى تطبيقها للوصول إلى الجمع بمضمون الدليل بآلية متبعة من أجل الهدف وتحقيق الفكرة.

ونحن إذ نقدم هذه الجهود فإننا نأمل أن نكون قد قدمنا شيئا يساعدنا على فتح الأبواب أمام أهل العلم والمعرفة خدمة لوطننا الحبيب ليبيا مما يلبي احتياجات بلدنا لمؤهلين في علوم التقنية الطبية تمكنهم من إحداث التطوير والتنمية في عالم يتسابق فيه الجميع نحو البناء ولا مكان فيه لغير العلماء والمتعلمين والمبدعين.

أ.د. عمران محمد القيب

وزير التعليم العالي والبحث العلمي

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اللائحة الداخلية لنظام الدراسة والامتحانات بكليات التقنية الطبية بالجامعات الليبية 2022م

الفصل الأول: أحكام عامة

المادة (1) تعريفات

تدل المصطلحات والعبارات الآتية أينما وردت في هذه اللائحة على المدلولات المبنية قرين كل منها ما لم يدل السياق على خلاف ذلك:

مجلس الكلية: يتألف مجلس الكلية من عميد الكلية، ووكيل الكلية للشؤون العلمية، ورؤساء الأقسام العلمية، وبحضور مسجل الكلية ومدير مكتب الشؤون الإدارية والمالية بالكلية، ورؤساء نقابات أعضاء هيئة التدريس، والموظفين، والطلاب بالكلية فيما يتعلق بشؤونهم، ولا يكون لهم حق التصويت وفقا للقانون رقم (4) للجامعات لسنة 2018م.

عميد الكلية: هو المسئول والمشرف على سير العمل بالكلية وتصريف أمورها العلمية والإدارية وفقا للتشريعات النافذة والسياسات التي ترسمها الجامعة.

رئيس القسم العلمي: هو عضو هيئة تدريس يرأس المجلس العلمي للقسم.

المجلس العلمي للقسم: يتشكل المجلس العلمي للقسم من رئيس القسم وعضوية جميع أعضاء هيئة التدريس القارين به، ويتم اختيار مقرر من بينهم، ويجوز حضور أي من الأساتذة المتعاونين وذلك عند مناقشة الجانب الذي يخصه فقط ولا يحق له التصويت على قرارات المجلس.

عضو هيئة التدريس: وهو كل من يحمل مؤهلاً علمياً عالياً (الماجستير أو الدكتوراه) أو ما يعادلهما من الشهادات التي تعترف بها الجهة المختصة بذلك؛ يؤهله للتدريس بإحدى مؤسسات التعليم العالي في إحدى التخصصات المعتمدة في الكلية ويقوم بعملية التدريس بها.

الدراسات العليا: يقصد بها مجموعة البرامج العلمية والبحثية ما بعد الدراسة الجامعية والتي تمنح مؤهلات عليا (ماجستير ودكتوراه)، وتهدف إلى تكوين وتأهيل الأساتذة والباحثين.

الطالب: هو الشخص الذي يدرس في هذه الكلية ابتداءً من تاريخ تسجيله في الدراسة حتى زوال هذه الصفة عنه إما بتخرجه أو بانسحابه أو بفصله من الكلية.

رقم القيد: رقم تسلسلي يمنح للطالب عند تسجيله في الكلية، يدل على الكلية والعام الجامعي والسنة الدراسية التي بدأ فيها الطالب.

الساعة الدراسية: هي انتظام الطالب في الدراسة لمدة ساعة أسبوعياً على مدى عام دراسي كامل.

المقرر الدراسي: هو مادة دراسية يدرسها الطالب، ويكون لكل مقرر اسم ورمز وتوصيف مفصل لمفرداته يميزه من حيث المحتوى عن المقررات الأخرى

الممتلكات: هي جميع ما تمتلكه الكلية من أصول مادية منقولة وغير منقولة.

الكليات المناظرة: وهي أي كلية من كليات التقنية الطبية في أي جامعة ليبية أو غير ليبية معترف بها من قبل وزارة التعليم.

الخطة الدراسية: هي مجموعة المقررات الدراسية والتي تشكل من وحداتها متطلبات التخرج التي يجب على الطالب اجتيازها بنجاح للحصول على درجة البكالوريوس في التقنية الطبية.

الوحدة الدراسية المعتمدة: ساعة واحدة تدريس "محا ضرة + عدد (ساعتين أو ثلاث) تدريب عملي" على مدى عام دراسي كامل.

المادة (2) كليات التقنية الطبية

تأسست أول كلية تقنية طبية سنة 1975م بجامعة طرابلس، لتلبي احتياجات المجتمع من الاختصاصين في مجالات التقنية الطبية وتساهم في دعم وسد النقص في سوق العمل في هذه الاختصاصات بالمرافق الصحية بالقطاعين العام والخاص والرفع من مستوى الخدمات الصحية بالبلاد، وتأسست ثاني كلية تقنية طبية بجامعة الزاوية سنة 2001 كأحد شعب كلية العلوم الصحية بجامعة الزاوية ثم توالى تأسيس العديد من كليات التقنية الطبية بمختلف الجامعات الليبية حتى بلغ عددها ألان خمسة عشرة كلية.

المادة (3) لغة الدراسة

اللغة الانجليزية هي لغة الدراسة والامتحانات بكليات التقنية الطبية باستثناء بعض المواد الداعمة.

المادة (4) الدرجات العلمية

وفقاً لنظم الدراسة والامتحانات المقررة بهذه اللائحة مع عدم الإخلال بالشروط والأسس المنظمة والمنصوص عليها في هذه اللائحة تمنح كليات التقنية الطبية بالجامعات الليبية الدرجات العلمية التالية:

- درجة الإجازة الجامعية التخصصية "بكالوريوس التقنية الطبية في أحد المجالات التي تدرس بها وفقا للأقسام العلمية" بعد اجتياز الطالب جميع المقررات الدراسية بنجاح وقضاء فترة التدريب (الامتياز).
- الإجازة العالية (الماجستير).
- الإجازة الدقيقة (الدكتوراه).

وفيما يخص الدراسات العليا تحدد بلائحة تفصيلية خاصة بها.

المادة (5) الأقسام العلمية

أ- تضم كلية التقنية الطبية الأقسام العلمية التالية:

ت	القسم	Department
1	فسم المختبرات الطبية	Department of Medical Laboratories
2	قسم الاشعة الطبية	Department of Medical Radiology
3	قسم العلاج الطبيعي وإعادة التأهيل	Department of Physical Therapy and Rehabilitation
4	قسم تقنية الأسنان	Department of Dental Technology
5	قسم تقنيات التخدير	Department of Anesthesia Technology
6	قسم الأجهزة والمعدات الطبية	Department of Medical Devices and Equipment's
7	قسم صحة المجتمع	Department of Public Health
8	قسم تقنية التغذية	Department of Nutrition Technology

ب- لمجلس الكلية استحداث أو إلغاء أو دمج أقسام علمية أخرى إذا اقتضت الحاجة إلى ذلك لمواكبة التطورات العلمية في مجالات التقنية الطبية ويتم ذلك بناء على اقتراح من القسم المختص وبعد اعتماده من مجلس الكلية ومجلس الجامعة ولجنة كليات التقنية الطبية بالجامعات الليبية، ويصدر بذلك قرار من وزارة التعليم العالي والبحث العلمي بناءً على توصية مجلسي الجامعة ولجنة كليات التقنية الطبية.

ج- يجوز استحداث شعب بالأقسام العلمية إذا اقتضت الحاجة لذلك بناءً على اقتراح من القسم العلمي المختص على أن يتم اعتماده من مجلسي الكلية والجامعة ولجنة كليات التقنية الطبية بالجامعات الليبية ويصدر بذلك قرار من وزارة التعليم العالي والبحث العلمي.

المادة (6) منظومة التسجيل والدراسة والامتحانات

أ. يكون بالكلية منظومة تسجيل وتوثيق الكترونية تسمى منظومة التسجيل والدراسة والامتحانات تعمل بإشراف قسم الدراسة والامتحانات ومسجل الكلية، تحفظ بها بيانات الطلاب وكل ما يتعلق بالدراسة والامتحانات وعلى الأخص:

- ملف الطالب الشخصي، وهو ملف إداري يتضمن البيانات الشاملة عن الطالب وفق نموذج يعد من قبل مكتب التسجيل.

- الملف الدراسي يحتوي على بطاقة الطالب الدراسية بما فيها المقررات المسجل بها والمقررات المعادلة وإيقاف القيد ومعدله العام والإنذارات أو حالات الفصل والمراجعات الموضوعية والتحقيقات وقرارات التأديب من تاريخ تسجيله بالكلية إلى تاريخ تخرجه أو فصله أو انتقاله من الكلية.

ب. تُوثق البيانات بمعرفة مكتب التسجيل والقسم المختص، ولا يُعتد بأي وثيقة صادرة تخص الطالب ما لم تكن مطابقة لبيانات المنظومة ومعتمدة من الجهة المختصة بإصدارها.

المـادة (7) المشرف الأكاديمي

تكلف الدراسة والامتحانات بالقسم مشرفاً أكاديميا لكل طالب يتبع القسم المعني ويكون من بين أعضاء هيئة التدريس يتولى:

1– إعداد وحفظ ملف علمي للطالب يحفظ به نسخاً من نتائجه الدراسية أولاً بأول يزوده بها مكتب التسجيل والدراسة والامتحانات بالقسم، ويتم تخصيص ساعتين ضمن الساعات التدريسية الأسبوعية للأستاذ مقابل إشرافه على مجموعة من عشرة طلاب.

2 – توجيه الطالب أثناء التسجيل والإشراف على برنامجه الدراسي.

3- تدوين كافة المقررات التي درسها الطالب ونتائجه وحساب كل من المعدل السنوي والمتوسط التراكمي العام ببطاقة الطالب الدراسية والتأكد من مطابقتها بمنظومة التسجيل المركزي.

4- تدوين حالات انقطاع الطالب وإيقاف القيد، وكذلك العقوبات التي تقع على الطالب ببطاقته الدراسية وإبلاغه بذلك.

5- تدوين عدد مرات الرسوب في أي مقرر ولفت انتباه الطالب لذلك.

6- تدوين الإنذارات وفق نص المادة (69) ببطاقة الطالب الدراسية ولفت انتباهه لذلك.

5- توضيح النقاط أو المواد المهمة بهذه اللائحة للطالب والرد على استفساراته.

6- يتولى المشرف الأكاديمي مع القسم المختص ومكتب التسجيل تطبيق لائحة نظام الدراسة والامتحانات والتأديب وعليهم إبلاغ مجلس الكلية بما يقع تحت اختصاصها قانوناً.

7- إبلاغ القسم المختص ومكتب التسجيل بوضع الطلبة الخاضعين لإشرافهم بالتالي:

أ- أنجزوا المقررات اللازمة للتخرج.

ب- استنفذوا المدة القانونية وفق المادة (21) من هذه اللائحة.

ج- تحصلوا على تقدير ضعيف جداً لسنة دراسية.

د- لم ينجزوا الوحدات المقررة في سنتين دراسيتين.

هـ- تحصلوا أو تجاوزوا الحد الأقصى للإنذارات.

و- أنهوا المدة القانونية أربع سنوات ثم خمس سنوات دراسية ثم الحد الأقصى ستة سنوات دراسية أو جاوزوا عدد مرات الرسوب في المقرر.

ح- أي حالات أخرى تستلزم التبليغ أو الإجراء.

المـادة (8) طلاب الكلية

يتم قبول وقيد الطلاب بالكلية كطلاب نظاميين وجميعهم متفرغون للدراسة النظامية بإحدى المجموعات أو أحد أقسام الكلية وفق الشروط والأسس والضوابط المنصوص عليها في هذه اللائحة، ويتولى كل طالب في بداية كل سنة دراسية تجديد قيده وفقاً للنماذج والإجراءات المعتمدة بالكلية وعليه المواظبة على حضور المحاضرات والدروس العملية المقررة والزيارات الميدانية وإعداد الواجبات والأوراق والتقارير العلمية المكلف بها وإجراء الاختبارات والامتحانات حسب ما يتم إقراره.

وعلى الطلاب التقيد باللوائح والنظم والتعليمات المنظمة لسير العملية التعليمية والمحافظة على مظهر ونظافة الكلية والقاعات الدراسية ومخالفة ذلك يعد من المخالفات التي يعاقب عليها.

المـادة (9) النشاط العام

يجوز لأي طالب مقيد بالكلية ممارسة الأنشطة العامة بمرافق النشاط العام المتوفرة بالكلية أو الجامعة في أوقات فراغه وخارج أوقات الدروس العملية والنظرية ومن بين الأنشطة العامة:

1- إقامة المعارض والمسابقات العلمية.

2- الأنشطة الرياضية المختلفة.

3- الأنشطة الفنية والثقافية.

4- المخيمـات.

المـادة (10) احتفالات التـخرج

تنظم الكلية عقب نهاية كل سنة دراسية حفل تخرج يتم خلاله:
1- توزيـع الشهادات وتكريم المتفوقين والمتميزين من الطلبة.
2- تكريم المتميزين من الكوادر الفنية والأكاديمية المشهود لهم ببذل الجهد وحسن الأداء.
3- يحدد مجلس الكلية موعد وتاريخ الحفل بالتنسيق مع رئاسة الجامعة.

الفصل الثاني: القبول والدراسة

المادة (11) نظام القبول والقيد والانتقال

مع عدم الإخلال بشروط التعليم بالجامعات الليبية المقررة بالتشريعات النافذة، يحدد مجلس الكلية القدرة الاستيعابية للكلية قبل بداية كل عام دراسي ويشترط لقبول من يتقدم للدراسة بكلية التقنية الطبية للحصول على الإجازة الجامعية الأولى (بكالوريوس التقنية الطبية) أن يكون مستوفيا للشروط العامة التي تحددها التشريعات النافذة للقبول وهي كالتالي:

1. أن يكون حاصلاً على شهادة حديثة لإتمام مرحلة الثانوية العامة علمي أو ما يعادلها من الخارج.
2. ألا يقل تقديره بالشهادة الثانوية العامة عن 70%.
3. أن يكون حسن السيرة والسلوك.
4. ألا يكون قد مضى على حصوله الشهادة الثانوية أكثر من سنتين.
5. أن يكون لائقاً صحياً وقادراً على متابعة الدروس النظرية والعملية والسريرية مع مراعاة اجتياز اختبار القبول والمقابلة الشخصية.
6. أن يتعهد الطالب الوافد بدفع الرسوم ونفقات الدراسة وفق اللوائح والقرارات والتشريعات الصادرة والمعمولة بها في الجامعات.
7. أن يتفرغ للدراسة كطالب نظامي وألا يكون مسجلاً بأي كلية أو جامعة أخرى.
8. يجوز قبول الطلاب الوافدين بمنح دراسية على حساب الدولة بنفس الأسس والقواعد التي تنظم قبول الطلاب الليبيين ويجوز لمجلس الكلية وضع شروط بخصوص قبول الطلاب الوافدين للدراسة على حسابهم الخاص وفق التشريعات النافذة، على أن يكون المتقدم للدراسة على حسابه الخاص مقيماً بليبيا إقامة اعتيادية طول مدة دراسته بالكلية ومستوفياً لكافة الشروط.

المادة (12) شروط النقل

يجوز للطالب الانتقال إلى الكلية من جامعات وكليات أخرى معترف بها ويتولى مكتب التسجيل بالكلية تلقي طلبات الانتقال على أن تكون مستوفية الشروط التالية:

1- أن تنطبق عليه الشروط الواردة في المادة (12) من هذه اللائحة.

2- أن يقدم طالب الانتقال مستنداته في موعد لا يقل عن ستة أسابيع قبل موعد السنة الجامعية.

3- أن تتضمن مستنداته شهادة أصلية تفيد بأنه غير مفصول لأسباب علمية أو تأديبية وغير موقوف عن التسجيل وتتم المعادلة بالقسم العلمي المختص.

4- أن تتضمن مستنداته وثيقة أو استمارة أصلية لإتمام المرحلة الثانوية التخصصية والعامة أو ما يعادلها.

5- يشترط على الطالب المنتقل للحصول على الإجازة المتخصصة دراسة 50 % (سنتان دراسيتين) على الأقل من المتطلبات اللازمة للتخرج بالقسم المنتقل إليه.

6- ألا يكون قد أمضى أكثر من نصف المدة الدراسية من تاريخ حصوله على الشهادة الثانوية.

7- للجنة العلمية المختصة أن تقرر قبول الطالب وقيده بالمرحلة المناسبة.

المـادة (13) لجنة المعادلة

تُشكل لجنة بقرار من عميد الكلية تسمى لجنة المعادلة بكل قسم علمي وتتكون من مسجل الكلية واثنين من أعضاء هيئة التدريس بها، وتتولى هذه اللجنة معادلة المقررات الدراسية للطلبة المتقدمين بطلبات نقل للدراسة بالكلية وفق الضوابط الآتية:

أ- لا يجوز معادلة مقررات الطالب المنتقل إلى الكلية في حال قد درس بلغة غير المعتمدة بكليات التقنية الطبية (اللغة الانجليزية).

ب- أن تكون المقررات المطلوب معادلتها متفقة من حيث مفرداتها مع المقررات التي تُدرّس بالكلية بنسبة لا تقل عن 75%.

ج- الارتباط الموضوعي بين المقررات الدراسية.

د- البت في الطلبات في أجل لا يتجاوز 4 أسابيع من تاريخ استلامها.

هـ- يتم فقط معادلة المقررات المنجزة التي تحصل فيها الطالب على 60% أو أكثر أما بقية المواد فيطلب منه إعادة دراستها.

و- تحسب المدة الدراسية للطلبة المنتقلين للكلية والتي قضاها الطالب في الكلية المنتقل منها ضمن المدة الدراسية المحددة في المادة (21) من هذه اللائحة ولا يحسب إيقاف القيد بالجهة المنتقل منها من ضمن هذه المدة.

ز- تُرفع توصيات اللجنة لمجلس الكلية للاعتماد وإصدار قرار بخصوص الطلبة المقبول نقلهم ويحال لمسجل الكلية لإتمام الإجراء.

ح- تعد المعادلة بعد اعتمادها من ثلاثة نسخ واحدة للطالب والثانية تحفظ بملف الطالب بمكتب المسجل والثالثة تحفظ بالقسم العلمي.

المـادة (14) تجديد القيد

يقوم الطالب بتجديد قيده وتسجيل مقرراته قبل بداية كل عام دراسي، وبما لا يتجاوز شهراً من بداية الدراسة وفق الإجراءات المعتمدة بإدارة مسجل الكلية، ويتم التسجيل إما بالحضور الشخصي أو إلكترونيا وذلك حسب السياق المتبع بالكلية أو الجامعة، ولا يعتبر هذا التسجيل رسميا إلا بعد توقيعه من الطالب واعتماده وكذلك سداد الرسوم الدراسية وفق النظم المالية المعمول بها بالجامعة، وكل من لم يثبت تجديد قيده خلال المدة المحددة يعتبر منقطعاً عن الدراسة.

المادة (15) تجديد القيد المتأخر

تعطى للطالب الفرصة لتجديد القيد المتأخر لحالات الغياب المشروع وفق مبرر يقبله مجلس القسم على أن يفي الطالب بالشروط التي يحددها مجلس الكلية، ولا يجوز للطالب تجديد قيده بعد انتهاء المدة المحددة في المادة (15) من هذه اللائحة إلا بموافقة مجلس الكلية وفي مدة لا تتجاوز أسبوعان من تاريخ انتهاء التسجيل.

المادة (16) الانقطاع عن التسجيل

1- إذا لم يتقدم الطالب للتسجيل لسنة دراسية بعذر تقبله الكلية يُمكن الطالب من الدراسة في السنة التالية ويحسب تغيب الطالب ضمن المدة المحددة للدراسة بالكلية.
2- إذا لم يتقدم الطالب للتسجيل لسنة دراسية أخرى خلال دراسته بالكلية بدون عذر مقبول، يفصل الطالب من الكلية وينتهي حقه في الاستمرار في الدراسة.
3- إذا لم يتقدم الطالب للتسجيل سنة كحد أقصى وكان له عذراً تقبله الكلية يمكن من الدراسة دون أن يحسب الغياب ضمن المدة الدراسية المحددة، وبذلك يستفيد الطالب من فرص إيقاف قيده.
4- إذا انقطع الطالب عن التسجيل لأكثر من سنة دراسية خلال دراسته بالكلية بعذر مقبول من مجلس الكلية يمكن من الدراسة دون أن يحسب الغياب ضمن المدة الدراسية المحددة ولا يجوز له وقف قيده بعد ذلك، ولا يعتبر الانقطاع غياب مشروعاً إلا في الحالات الآتية:
أ- ظروف مرضية قاهرة تعيق دون تحصيله الدراسي.
ب- أن يكون الطالب نزيلا بالمستشفى شريطة إبلاغ القسم المختص بذلك بمدة لا تقل 24 ساعة من موعد إجراء الامتحان.
ج- ظروف الحروب والتهجير، وفي كل الأحوال لا ينظر في مبررات الغياب لأي سبب كان إذا زادت مدة الانقطاع عن التسجيل عن سنتين سواء كانت متتالية أو متقطعة ما لم يوقف الطالب قيده.

المادة (17) التنسيب للأقسام العلمية

يتم التنسيب للأقسام حسب النظام المتبع وحسب القدرة الاستيعابية للأقسام العلمية المحددة مسبقاً في المادة (6) من هذه اللائحة ويتم اعتماده من مجلس الكلية.

المادة (18) تغيير التخصص

يجوز للطالب تغييـر تخصصه مرة واحدة خلال فترة دراسته بالكلية طبقاً للشروط التالية:

1.أن لا يكون قد قضى أكثر من سنة دراسية في القسم المنسب إليه.

2.أن لا يكون مفصولاً أو انطبقت عليه شروط الفصل في القسم المنتقل منه أو موقوفاً عن التسجيل.

3.لا يعتبر هذا التغيير نافذاً رسمياً إلا بعد إخلاء طرفه من القسم المنتقل منه وتسجيله بمنظومة التسجيل والتوثيق المركزي.

4.ألا يكون الطالب قد سبق انتقاله من كلية أخرى.

الفصل الثالث: نظام الدراسة

المادة (19) لجنة الدراسة والامتحانات

مع عدم الإخلال بمهام رئيس قسم الدراسة والامتحانات ومسجل الكلية ومجلس الكلية تنشأ لجنة تسمى لجنة الدراسة والامتحانات يرأسها رئيس قسم الدراسة والامتحانات بالكلية وتكون عضويتها من:

أ- مسجل الكلية (مقررا).

ب- منسق الدراسة والامتحانات بكل قسم من الأقسام العلمية بالكلية على أن يكون من بين أعضاء هيئة التدريس لذلك القسم، ويحسب له ما يعادل ست ساعات أسبوعية نظير تكليفه بهذه المهمة، وتتولى اللجنة المهام الآتية ويصدر بها قرار وفق التشريعات النافذة:

1- اقتراح مواعيد بداية ونهاية الدراسة.

2- اقتراح مواعيد امتحانات الأعمال والامتحانات النهائية.

3- اقتراح مواعيد التسجيل وإعداد النماذج الخاصة بذلك.

4- دراسة طلبات الطلاب المتعلقة بالغياب عن الامتحانات بمبررات مقبولة ومنح فرص استثنائية للطلبة المتعثرين وإعداد مقترحات للعرض على مجلس الكلية.

5- دراسة جميع القضايا المتعلقة بالدراسة والامتحانات بالكلية وإعداد التوصيات للعرض على مجلس الكلية.

6- الإشراف على جميع الامتحانات النصفية والنهائية بالكلية واتخاذ التدابير اللازمة لإنجاحها.

7- البث في طلبات النقل بين الأقسام وانتقال الطلاب من وإلى الكلية على أن تعرض هذه الاقتراحات والتوصيات على مجلس الكلية لاتخاذ القرار المناسب بشأنها.

المادة (20) نظام ومدة الدراسة

تتبع الكليات نظام السنة الدراسية وتكون مدة الدراسة للحصول على الدرجة الجامعية الأولى كالتالي:

أ- أربعة سنوات دراسية تقسم فيها خطة الدراسة (البرنامج الدراسي) بكل قسم على المدة المحددة،

ب- فترة امتياز لمدة ستة أشهر يقضيها الطالب بأحد المؤسسات الصحية أو البحثية المتخصصة بإشراف مباشر من قبل القسم العلمي الذي يتبعه الطالب بعد انجازه لكل المقررات الدراسية، على أن يقدم الطالب خلال هذه الفترة مشروع تخرج في مجال تخصصه ويجتاز مناقشته بنجاح أمام لجنة مختصة يقترحها القسم العلمي ويصدر بها قرار من عميد الكلية.

ج- يجوز الانتقال من النظام السنوي الى نظام الفصل الدراسي بعد موافقة لجنة كليات التقنية الطبية واعتماد ذلك من وزارة التعليم العالي والبحث العلمي على ان لا يتعارض ذلك مع المقررات الدراسية الواردة في هذا الدليل (دليل الدراسة والامتحانات بكليات التقنية الطبية بالجامعات الليبية) ومفردات كل مقرر.

المادة (21) البرنامج الدراسي

يمنح الطالب إفادة التخرج (بكالوريوس التقنية الطبية في مجال تخصصه وفقا للقسم الذي يتبعه)، بعد اجتياز كل المنصوص عليه في المادة (21) من هذه اللائحة، كما يمنح شهادة امتياز عن فترة الامتياز (التي قضاها) يوضح فيها عنوان مشروع التخرج الذي أنجزه خلال هذه الفترة.

المادة (22) العام الدراسي

تكون بداية العام الدراسي الجامعي حسب الخطة الدراسية التي يضعها مجلس الكلية أو مجلس الجامعة وعادة عادة تكون في الأول من شهر أكتوبر من كل عام وينتهي بنهاية شهر مايو يتخلله إجازة نصف العام الدراسي لمدة أسبوعين.

المادة (23) الدروس النظرية والعملية

يجب على الطالب أن يتابع الدروس النظرية والعملية وأن يؤدي التدريبات العملية المقررة في الأماكن والمواعيد التي تحددها الكلية والقسم العلمي المختص.
يحرم الطالب من دخول الامتحان النهائي في أي مقرر إذا تجاوزت نسبة غيابه 25% في كل من الدروس العملية والنظرية وترصد له درجة (الصفر) في المقرر ما لم يتقدم بعذر يقبله مجلس الكلية في مدة أقصاها أسبوعين من تاريخ انتهاء العذر.

المادة (24) إيقاف القيد

يجوز للطالب المسجل ولأي سبب تقبله لجنة الدراسة والامتحانات وقف قيده بما لا يتجاوز سنة جامعية واحدة طيلة فترة دراسته وفق النموذج المعد لذلك إذا ثبت أن لديه عذر يمنعه من مواصلة الدراسة، على أن يقدم طلب إيقاف القيد خلال مدة لا تتجاوز شهران من بداية الدراسة، ولا يجوز النظر في الطلب إذا تقدم به الطالب بعد زوال العذر.

المادة (25) المقـرر الدراسـي

يحدد كل مقرر بعدد من الوحدات بحيث توضح عدد ساعات المحاضرات الأسبوعية وكذلك الدروس العملية والسريرية أو التدريب، ويقسم كل مقرر على مجموع المحاضرات المحددة لذلك المقرر، وتتبع الدراسة بالكلية نظام المقررات حسب اعتمادها على بعضها البعض ويكون لكل مقرر دراسي الآتي:

1- أستاذ يكلفه القسم ويكون من أعضاء هيئة التدريس بالكلية أو من خارجها مع وجود معاونين من المعيدين ومساعدي بحاث وفنيين.
2- كتاب منهجي وكتب مرجعية يحددها أستاذ المقرر ويعتمدها القسم.
3- قاعة دراسية ومعمل أو مختبر (حسب طبيعة كل مقرر).
4- جدول أسبوعي.

ويجوز أن يكون للمقرر الواحد أكثر من مجموعة بشرط ألا يزيد عدد طلاب كل مجموعة عن (40) طالباً وفي حالة تجاوز ذلك تضاعف الساعات المحتسبة لعضو هيئة التدريس، ولا يجوز لأي طالب دراسة أي مقرر ما لم يكن مسجلاً به رسمياً، وعلى الطالب المسجل بمقرر الحصول على درجة النجاح المقررة لإنجازه.

المادة (26) أستاذ المقرر

يتولى تدريس كل مقرر دراسي عضو هيئة تدريس متخصص أو أكثر ويجوز أن يكون من المتعاونين شرط حصوله على مؤهل عاليا لإجازة العالية (الماجستير) على الأقل ويكون مستوفى الشروط في ذات التخصص، ويقوم أستاذ المقرر بتنفيذ ما يخصه لما يرد بهذه اللائحة والتشريعات النافذة، ويخصص أستاذ المقرر جزء من المحاضرة الأولى في بداية كل سنة دراسية للآتي:

1- تقديم نفسه لطلبة المقرر وتحديد الأيام والساعات المكتبية التي يتواجد فيها للمراجعة.
2- توضيح محتويات المقرر ومواعيد اختبارات الأعمال والامتحان النهائي وكيفية حساب أعمال السنة.
3- تحديد الكتب والمراجع المستخدمة للمقرر الدراسي.

4- تحديد أسلوب التقييم والمتابعة أثناء الدراسة.

5- تنفيذ التعليمات الصادرة عن مجلس الكلية أو قسم الدراسة والامتحانات ذوي العلاقة بالمقرر، ويجوز أن يساعد أستاذ المقرر في تنفيذ مهامه أحد المعيدين أو مساعدي البحاث والفنيين متى كان ذلك ضرورياً.

المادة (27) الوحدة الدراسية

أ- تعادل الوحدة الدراسية ساعة واحدة للمحاضرة النظرية أو ساعة إلى ثلاثة ساعات عملية أو ثلاثة ساعات سريريه في الأسبوع.

ب- يكون لكل مقرر مفردات لمحتوياته ويحفظ في القسم المختص ومكتب التسجيل والتوثيق مع نشر نبذه مختصرة عن المقرر بدليل الكلية.

ج- تحسب الوحدات الدراسية المعملية والندوات العلمية وما في حكمها بعدد وحدات يناسب مع مدتها و ينص عليها في البرنامج الدراسي للقسم.

المادة (28) رموز المقررات الدراسية

يرمز كل مقرر بحرفين كبيران باللغة الانجليزية (AB)، وثلاثة أرقام (106) ويكتب على الصيغة (AB106) حيث:

أ- يدل الحرفان(AB) على القسم المختص.

ب- تدل خانة المئات في الأرقام (106)على مستوى المقرر بالسنوات الدراسية.

المادة (29) تصنيف المقررات

تنقسم المقررات التي تدرس بأقسام كلية التقنية الطبية إلى:

أولاً: مقررات تخصصية يقرها القسم الذي ينتمي إليه الطالب وبما لا يتجاوز 75% من الوحدات الدراسية اللازمة للتخرج وتشمل:

أ- مقررات نظرية وعملية في مجال تخصص القسم.

ب- مقررات الدراسة السريرية أو المعملية ومشاريع التخرج.

ثانياً: مقررات داعمة وهي مقررات غير تخصصية ولكنها ضرورية للتخصص بناءً على برنامج القسم التابع له الطالب بما لا يقل عن (15%) من مجموع الوحدات اللازمة لتخريج الطالب.

ثالثاً: مقررات متطلبات الجامعة والكلية وهي مقررات إلزامية بما لا يتجاوز (10%) من مجموع الوحدات الدراسية اللازمة لتخريج الطالب.

توزع هذه المقررات الواردة في الفقرات أولاً – ثانياً – ثالثاً على البرنامج الدراسي للحصول على الإجازة المتخصصة بما يتفق وخطة كل قسم وبما لا يتجاوز مدة أربع سنوات، ويتولى كل قسم إعداد اللائحة الخاصة بآلية تنفيذ وتوزيع درجات الأعمال والمناقشة النهائية لمقررات الدراسة السريرية أو المعملية ومشاريع التخرج على أن تعتمد من مجلس الكلية.

المادة (30) توزيع المقررات على السنوات الدراسية

تُوزع المقررات الدراسية على السنوات الدراسية (الخطة الدراسية) بكل قسم علمي كما يلي:

أولاً: السنة الدراسية الأولى لجميع الأقسام بكليات التقنية الطبية

1st Year All Departments								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year

1.	Arabic Language	MT101	2	2	2	-	2	56
2	Medical Terminology	MT102	2	2	2	-	2	56
3	Computer Applications	MT103	4	3	2	2	3	112
4.	Physics	MT104	4	3	2	2	3	112
5.	Chemistry	MT105	4	3	2	2	3	112
6.	Biology	MT106	4	3	2	2	3	112
7.	Bio-Statistics	MT107	2	2	2	-	2	56
8.	First Aid &Occupational Safety	MT108	4	3	2	2	3	112
9.	Instrumentation	MT109	4	3	2	2	3	112
Total			30	24	18	12	24	840

ثانيا: قسم المختبرات الطبية

2nd Year Medical Laboratories								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	General Microbiology	ML203	4	3	2	2	3	112
4.	Histology	MT203	4	3	2	2	3	112
5.	Physiology	MT204	4	3	2	2	3	112
6.	Medical Psychology & Teaching Methodology	MT205	2	2	2	-	2	56
7.	Professional Ethics	MT206	2	2	2	-	2	56
8.	Health Management	MT208	2	2	2	-	2	56
Total			28	21	16	10	21	728

3rd Year Medical Laboratories								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	2	2	-	2	56
2	Analytical Chemistry	MT302	4	3	2	2	3	112
3.	Clinical Chemistry I	ML301	4	3	2	2	3	112
4.	Hematology	ML302	4	3	2	2	3	112
5	Medical Bacteriology	ML303	4	3	2	2	3	112
6	Medical Parasitology	ML304	4	3	2	2	3	112
7.	Pathology	MT305	4	3	2	2	3	112
8.	Hospital Practical Training-I	ML306	6	2	-	6	2	168
Total			32	22	14	18	22	896

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4th Year Medical Laboratories								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Clinical Chemistry II	ML401	4	3	2	2	3	112
2.	Blood Bank Blood Transfusion	ML402	4	3	2	2	3	112
3.	Medical Virology	ML403	4	3	2	2	3	112
4.	Molecular Diagnostics	ML404	4	3	2	2	3	112
5.	Medical Mycology	ML405	4	3	2	2	3	112
6.	Hospital Practical Training II	ML406	6	2	-	6	2	168
7.	Immunology and Serology	PT407	4	3	2	2	3	112
8.	Lab Management and quality control	ML408	4	3	2	2	3	112
Total			34	23	14	20	23	952

Medical Laboratories Department	1st year	2nd year	3rd year	4th year	Total
Credits	24	21	22	23	90
Theoretical Hours	18	16	14	14	62
Practical Hours	12	10	18	20	60
Totals of Hours	840	728	896	952	3416

ثالثاً : قسم الأشعة الطبية

2nd Year Medical Radiology								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	Physiology	MT205	4	3	2	2	3	112
4.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
5.	Professional Ethics	MT207	2	2	2	-	2	56
6.	Health Management	MT208	2	2	2	-	2	56
7.	Radiographic Technique I	RD201	4	3	2	2	3	112
8.	Radiographic Imaging	RD203	4	3	2	2	3	112
9.	Radiation Physics	RD204	4	3	2	2	3	112
10	Radiation Protection	RD205	4	3	2	2	3	112
Total			34	27	20	14	27	952

3rd Year Medical Radiology								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	2	2	-	2	56
2.	Pathology	MT305	4	3	2	2	3	112
3.	Radiographic Technique II	RD301	4	3	2	2	3	112
4.	Radiation Anatomy (General and Cross Sectional Anatomy)	RD302	4	3	2	2	3	112
5.	CT, US, MRI Physics	RD303	2	2	2	-	2	56
6.	Nuclear Medicine & Radiotherapy Physics	RD304	4	3	2	2	3	112
7.	Oncology	RD305	2	2	2	-	2	56
8.	Radiation Biology	RD306	2	2	2	-	2	56
9.	Radiation & Pharmacology	RD307	2	2	2	-	2	56
10.	Hospital Practical Training I	RD308	6	2	-	6	2	168
Total			32	24	18	14	24	896

4th Year Medical Radiology								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Radiographic Technique III	RD401	4	3	2	2	3	112
2.	Radiographic Pathology and Image Interpretation	RD402	4	3	2	2	3	112
3.	CT, MRI& US Techniques	RD403	4	3	2	2	3	112
4.	Nuclear Medicine Technique	RD404	4	3	2	2	3	112
5.	Radiotherapy Planning	RD405	4	3	2	2	3	112
6.	Radiotherapy Techniques	RD406	4	3	2	2	3	112
7.	Digital Image & Quality Management in Radiology Departments	RD407	4	3	2	2	3	112
8	Hospital Practical Training II& Study Case	RD408	6	2	-	6	2	168
Total			34	23	14	20	23	952

No	Medical Radiology Department	1st year	2nd year	3rd year	4th year	Total
1	Credits	24	27	24	23	98
2	Theoretical Hours	18	20	18	14	70
3	Practical Hours	12	14	14	20	60
4	Totals of Hours	840	952	896	952	3640

رابعاً: قسم العلاج الطبيعي وإعادة التأهيل

2nd Year Physiotherapy& Rehabilitation								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Principles of Physiotherapy	PT201	4	3	2	2	3	112
2.	Human Anatomy	MT201	4	3	2	2	3	112
3.	Biochemistry	MT202	4	3	2	2	3	112
4.	General Microbiology	MT203	4	3	2	2	3	112
5.	Histology	MT204	4	3	2	2	3	112
6.	Physiology	MT205	4	3	2	2	3	112
7.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
8.	Professional Ethics	MT207	2	2	2	-	2	56
9.	Health Management	MT208	2	2	2	-	2	56
Total			30	24	18	12	24	840

3rd Year Physiotherapy& Rehabilitation								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Testing And Measurement Methods	PT301	4	3	2	2	3	112
2.	Pediatrics And Physiotherapy	PT302	4	3	2	2	3	112
3.	General Surgery & Physiotherapy	PT303	4	3	2	2	3	112
4.	Therapeutic Exercise	PT304	4	3	2	2	3	112
5.	Medical Investigation	PT305	4	3	2	2	3	112
6.	Pharmacology	PT306	4	3	2	2	3	112
7.	Hospital Practical Training-I	PT307	6	2	-	6	2	168
8.	Research Methodology	MT301	2	2	2	-	2	56
9.	Pathology	MT305	4	3	2	2	3	112
Total			36	25	16	20	25	1008

4th Year Physiotherapy& Rehabilitation								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Gynecology-Obstetric And Physiotherapy	PT401	4	3	2	2	3	112
2.	Internal Medicine and Physiotherapy	PT402	4	3	2	2	3	112
3.	Rehabilitation Of Injuries And Neurological Diseases	PT403	4	3	2	2	3	112
4.	Orthopedics And Physical Therapy	PT404	4	3	2	2	3	112

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5.	Sport Injuries & Rehabilitation	PT405	4	3	2	2	3	112
6.	Electro and Hydro Therapy	PT406	4	3	2	2	3	112
7.	Hospital Practical Training-II	PT407	6	2	-	6	2	168
Total			30	20	12	18	20	840

No	Physiotherapy& Rehabilitation Dept.	1st year	2nd year	3rd year	4th year	Total
1	Credits	24	24	25	20	93
2	Theoretical Hours	18	18	16	12	64
3	Practical Hours	12	12	20	18	62
4	Totals of Hours	840	840	1008	840	3528

خامساً: قسم تقنية الأسنان

2nd Year Dental Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	General Microbiology	MT203	4	3	2	2	3	112
4.	Histology	MT204	4	3	2	2	3	112
5.	Physiology	MT205	4	3	2	2	3	112
6.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
7.	Professional Ethics	MT207	2	2	2	-	2	56
8.	Health Management	MT208	2	2	2	-	2	56
9.	Pathology	DT202	4	3	2	2	3	112
10.	Dental Materials	DT203	4	3	2	2	3	112
Total			34	27	20	14	27	952

3rd Year Dental Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Anatomy (Head &Neck)	DT301	4	3	2	2	3	112
2.	Dental Anatomy	DT302	4	3	2	2	3	112
3.	Removable Prosthodontic I	DT303	6	4	2	4	4	168
4.	Fixed. Prosthodontic I	DT304	6	4	2	4	4	168
5.	Oral Pathology	DT305	4	3	2	2	3	112
6.	Oral Microbiology	DT306	4	3	2	2	3	112
7.	Pharmacology	DT307	4	3	2	2	3	112
8.	Research Methodology	MT301	2	2	2	-	2	56
9.	Oral Histology	DT309	2	2	2	-	2	56
Total			36	27	18	18	27	1008

4th Year Dental Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Removable Prosthodontic II	DT401	6	4	2	4	4	168
2.	Fixed.ProsthodonticII	DT402	6	4	2	4	4	168
3.	Removable Orthodontics appliance	DT403	6	4	2	4	4	168
4.	Maxillofacial Prosthetic	DT404	6	4	2	4	4	168
5.	Occlusion Concept	DT405	6	4	2	4	4	168
6.	Oral Health	DT406	2	2	2	-	2	56
Total			32	22	12	20	22	896

No	Dental Technology Department	1st year	2nd year	3rd year	4th year	Total
1	Credits	24	27	28	22	101
2	Theoretical Hours	18	20	18	12	68
3	Practical Hours	12	14	18	20	64
4	Totals of Hours	840	952	1008	896	3696

سادساً: قسم تقنية التخدير

2nd Year Anesthesia Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	General Microbiology	MT203	4	3	2	2	3	112
4.	Histology	MT204	4	3	2	2	3	112
5.	Physiology	MT205	4	3	2	2	3	112
6.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
7.	Professional Ethics	MT207	2	2	2	-	2	56
8.	Health Management	MT208	2	2	2	-	2	56
9.	Physics related Anesthesia	AT201	4	3	2	2	3	112
10	Anesthesia equipment's principles and applications	AT202	4	3	2	2	3	112
Total			34	28	20	14	28	952
3rd Year Anesthesia Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	2	2	-	2	56

2.	Pathology	MT305	4	3	2	2	3	112
3.	Principle of Anesthesia	AT301	4	3	2	2	3	112
4.	Paediatric	AT302	2	2	2	-	2	56
5.	Medicine	AT303	2	2	2	-	2	56
6.	Surgery	AT304	2	2	2	-	2	56
7.	Diagnostic Investigations	AT305	4	3	2	2	3	112
8.	Pharmacology	AT306	2	2	2	-	2	56
Total			22	19	16	6	19	616

4th Year Anesthesia Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Anesthesia	AT401	6	4	2	4	4	168
2.	Intensive care	AT402	6	4	2	4	4	168
3.	Emergency Medicine	AT403	2	2	2	-	2	56
4.	Emergency Surgery	AT404	2	2	2	-	2	56
5.	Gynecology and Obs	AT405	2	2	2	-	2	56
6.	Pain management	AT406	4	3	2	2	3	112
Total			22	17	12	10	17	616

No	Anesthesia Technology Department	1st year	2nd year	3rd year	4th year	
1	Credits	24	27	19	14	84
2	Theoretical Hours	18	20	16	10	64
3	Practical Hours	12	14	06	08	40
4	Totals of Hours	840	952	616	616	3024

سابعاً: قسم الأجهزة والمعدات الطبية

2nd Year Medical Devices and Equipment								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	Physiology	MT205	4	3	2	2	3	112
4.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
5.	Professional Ethics	MT207	2	2	2	-	2	56
6.	Health Management	MT208	2	2	2	-	2	56
7.	Mathematics	DE201	4	3	2	2	3	112
8.	Logic Design	DE202	4	3	2	2	3	112

9.	Programming language (C++)	DE204	4	3	2	2	3	112
Total			30	24	18	12	24	840

3rd Year Medical Devices and Equipment								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	2	2	-	2	56
2.	Analog Electronics	DE301	4	3	2	2	3	112
3.	Electrical Measurements	DE302	4	3	2	2	3	112
4.	Engineering Drawing	DE303	4	3	2	2	3	112
5.	Digital Signal Processing	DE304	4	3	2	2	3	112
6.	Sensors and Transducers	DE305	4	3	2	2	3	112
7.	Microprocessor and Interface	DE306	4	3	2	2	3	112
8.	Control Systems	DE307	4	3	2	2	3	112
9.	Electrical Circuits	DE308	4	3	2	2	3	112
Total			34	26	18	16	26	952

4th Year Medical Devices and Equipment								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Electromagnetic Fields	DE401	4	3	2	2	3	112
2.	Medical Instrumentation	DE402	4	3	2	2	3	112
3.	Digital image Processing	DE403	4	3	2	2	3	112
4.	Medical Imaging Equipment's	DE404	4	3	2	2	3	112
5.	Medical Information	DE405	4	3	2	2	3	112
6.	Hospital Engineering	DE406	4	3	2	2	3	112
7.	Neural Network	DE407	4	3	2	2	3	112
Total			28	21	14	14	21	784

No	Medical Devices and Equipment	1st year	2nd year	3rd year	4th year	Total
1	Credits	24	24	26	21	95
2	Theoretical Hours	18	18	18	14	68
3	Practical Hours	12	12	16	14	54
4	Totals of Hours	840	840	952	784	3416

ثامناً: قسم صحة المجتمع

2nd Year Public Health Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	General Microbiology	MT203	4	3	2	2	3	112
4.	Histology	MT204	4	3	2	2	3	112
5.	Physiology	MT205	4	3	2	2	3	112
6.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
7.	Professional Ethics	MT207	2	2	2	-	2	56
8.	Health Management	MT208	2	2	2	-	2	56
9	Fundamentals of Nursing	PH202	4	3	2	2	3	112
Total			30	24	18	12	24	840

3rd Year Public Health Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	2	2	-	2	56
2.	Pathology	MT305	4	3	2	2	3	112
3.	Principles of Epidemiology	PH301	4	3	2	2	3	112
4.	Family Health	PH302	4	3	2	2	3	112
5.	School Health	PH303	2	2	2	-	2	56
6.	Public health laws	PH304	2	2	2	-	2	56
7.	Primary Health Care	PH305	4	3	2	2	3	112
8.	Pharmacology	PH306	2	2	2	-	2	56
9.	Practical Training I	PH307	6	2	-	6	2	168
10.	Parasitology	PH308	4	3	2	2	3	112
Total			34	25	18	16	25	952

4th Year Public Health Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	General Epidemiology	PH401	4	3	2	2	3	112
2.	Maternal & Child Health	PH402	4	3	2	2	3	112
3.	Environmental health	PH403	4	3	2	2	3	112
4.	Occupational Health	PH404	4	3	2	2	3	112
5.	Nutrition & Public Health	PH405	4	3	2	2	3	112
6.	Health Economics	PH406	4	3	2	2	3	112
7.	Health promotion	PH407	4	3	2	2	3	112
8.	Practical Training	PH408	6	2	-	6	2	168
Total			34	23	14	20	23	952

No	Public Health Department	1st year	2nd year	3rd year	4th year	Total
1	Credits	24	24	25	23	96
2	Theoretical Hours	18	18	18	14	68
3	Practical Hours	12	12	16	20	60
4	Totals of Hours	840	840	952	952	3584

تاسعاً: قسم تقنية التغذية

2nd Year Nutrition Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/ year
1.	Human Anatomy	MT201	4	3	2	2	3	112
2.	Biochemistry	MT202	4	3	2	2	3	112
3.	General Microbiology	MT203	4	3	2	2	3	112
4.	Histology	MT204	4	3	2	2	3	112
5.	Physiology	MT205	4	3	2	2	3	112
6.	Medical Psychology & Teaching Methodology	MT206	2	2	2	-	2	56
7.	Professional Ethics	MT207	2	2	2	-	2	56
8.	Health Management	MT208	2	2	2	-	2	56
9.	Food Chemistry	NT201	4	3	2	2	3	112
10.	Analytical Chemistry	NT202	4	3	2	2	3	112
11.	Principles of Food safety & Quality	NT203	2	2	2	-	2	56
Total			36	29	22	14	29	1008

3rd Year Nutrition Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Food Analysis	NT301	4	3	2	2	3	112
2.	Nutrition Through Lifespan	NT302	2	2	2	-	2	56
3.	Nutritional Epidemics and Toxicology	NT303	2	2	2	-	2	56
4.	Management & Quality of Food services in Hospital	NT304	2	2	2	-	2	56
5.	Therapeutic Nutrition I	NT305	4	3	2	2	3	112
6.	Food Microbiology	NT306	4	3	2	2	3	112
7.	Nutritional Elements & Metabolism	NT307	2	2	2	-	2	56
8.	Nutrition from Animal Sources	NT308	4	3	2	2	3	112
9.	Pharmacology & Nutrition	NT309	2	2	2	-	2	56
10.	Research Methodology	MT301	2	2	2	-	2	56
Total			28	24	20	8	24	784

4th Year Nutrition Technology Department								
No	Subject	Code	Weakly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Pathology & Nutrition	NT401	2	2	2	-	2	56
2.	Community Health & Nutritional Education	NT402	2	2	2	-	2	56
3.	Nutrition from Plant Sources	NT403	2	2	2	-	2	56
4.	Therapeutic Nutrition-II	NT404	4	3	2	2	3	112
5.	Immunology& Nutrition	NT405	4	3	2	2	3	112
6.	Healthy Nutrition & Fitness	NT406	2	2	2	-	2	56
7.	Hospital Training	NT407	6	2	-	6	2	168
Total			22	16	12	10	16	616

No	Medical Nutrition department	1st year	2nd year	3rd year	4th year	Total
1	Credits	24	29	24	16	93
2	Theoretical Hours	18	22	20	12	72
3	Practical Hours	12	14	08	10	44
4	Totals of Hours	840	1008	784	616	3248

المـادة (31) الجدول الدراسي

عند وضع الجدول الدراسي يجب مراعاة الآتي:

أ- أن يحتوي الجدول على رمز المقرر ورقم المجموعة والقاعة وتوقيت المحاضرة واسم الأستاذ الذي يُدرّسها، على أن يكون استعمال القاعات الدراسية والمعامل والمختبرات والمدرجات وفق نظام العمل الذي يقرره مجلس الكلية بما يسمح باستغلال واستثمار كل الإمكانيات المتاحة بالكلية والتنسيق مع باقي الكليات بالجامعة خاصة في المعامل.

ب- توزيع المقررات الدراسية على أيام الأسبوع الدراسي.

ج- لا يسمح بأن يكون لأي مقرر أكثر من محاضرتين في اليوم الواحد باستثناء المقررات المعملية، والتدريب العملي.

د- يُعلن الجدول الدراسي قبل بداية الدراسة.

هـ- لا يجوز تغيير مواعيد الجدول الأسبوعي لأي مقرر إلا بعد موافقة رئيس القسم المختص وقسم الدراسة والامتحانات.

المادة (32) الوسـائل التعليميـة

يستخدم أستاذ المقرر كافة الوسائل المساعدة على تنفيذ العملية التعليمية وتحسين الأداء بالكلية وعلى الأخص:

1- الأشخاص المساعدين من المعيدين، مساعدي بحاث، وفني معامل وما في حكمهم.

2- القاعة الدراسية والمعمل المناسبين.

3- الأجهزة والمعدات والمختبرات والمواد وغيرها من وسائل الإيضاح اللازمة لتنفيذ العملية التعليمية ويتم توفيرها من ميزانية الجامعة أو من موارد الكلية (رسوم أو استثمار أو ما في حكمها).
4- المكتبة العلمية بما تحويه من كتب ومراجع ودوريات علمية.
5- شبكة المعلومات الدولية.
6- المكتبة الإلكترونية والمنصة الإلكترونية الجامعية.

المادة (33) عدم استكمال محتويات مقرر

لا يتم إجراء الامتحان النهائي لمقرر ما لم تصل نسبة إنجازه إلى 75% من محتوياته على الأقل مهما كانت الأسباب، ويحال الأمر إلى مجلس الكلية، وذلك لاتخاذ قرار بإلغاء المقرر أو تكملته بناءً على الظروف التي أدت إلى هذا الأمر.

الفصل الرابع: نظام الامتحانات والتقييم

المادة (34) شروط التقدم للامتحانات

يشترط في الطالب المتقدم للامتحانات النصفية والامتحانات النهائية أن يكون مستوفيا لشروط القيد لأحكام هذه اللائحة، وأن يتقيد بما يلي:
1- اصطحاب بطاقة التعريف التي توضح أنه مسجل في تلك السنة الدراسية.
2- يحضر على الطالب المتقدم للامتحان اصطحاب أي كتاب أو ورقة ولو كانت خالية من الكتابة أو الحاسبات المبرمجة عدا ما يسمح به أستاذ المقرر كما يمنع اصطحاب أو استخدام الهواتف المحمولة داخل مكان الامتحان.
3- يحضر على الطالب الكلام أثناء الامتحانات أو القيام بأي عمل من شأنه الإخلال بنظم الامتحانات.
4- التقيد بالتعليمات المنظمة لسير الامتحانات والمراقبة والصادرة من الكلية أو لجنة الامتحانات والمراقبة والمراقبين بقاعة الامتحانات، وكذلك ملاحظات أستاذ المقرر.
5- التقيد بالتشريعات النافذة والمنظمة لسير الدراسة والامتحانات بالجامعات الليبية، مع عدم الإخلال بالمواد (47) و (49) و (70) من هذه اللائحة.

المادة (35) عقد الامتحانات

تعقد الامتحانات النهائية للدورين الأول والثاني بشقيها النظري والعملي بجميع السنوات على النحو التالي:
الدور الأول: يعقد مع بداية شهر يونيو (6) وحتى منتصف شهر يوليو (7) متضمنة تسليم النتائج من انتهاء الدراسة.
الدور الثاني: يعقد خلال الأسبوع الأول من شهر سبتمبر.
ويشترط لدخول الطالب للامتحان النهائي النظري الدور الأول اجتيازه للامتحان النهائي العملي بنسبة 60% على الأقل، وينطبق ذلك أيضاً على امتحانات الدور الثاني.

المادة (36) الامتحانات النصفية

تجرى الامتحانات النصفية في المقررات التي يدرسها الطالب في السنة المقيد بها على النحو الآتي:
1- امتحانان نصفيان للمواد التي لا يوجد بها الشق العملي على أن يجرى الامتحان النصفي الأول خلال الأسبوع الثاني عشر (12)، والنصفي الثاني خلال الأسبوع الثالث والعشرون (23) من بداية الدراسة.

2- يجوز للمواد التي يوجد بها الشق العملي إجراء امتحان نصفي واحد نظري ونصفي آخر عملي، ويتولى القائمون بتدريس المادة بإجراء هذه الامتحانات وفقا للنظام الذي يقرره القسم المختص.
3- لا يجوز في أي حال من الأحوال إجراء أي امتحانات نصفية أثناء فترة الامتحانات النهائية.
4- تخصص لمجموع هذه الاختبارات والتقييم نسبة 40% من الدرجة الكلية للمقرر.
5- يتولى أستاذ المقرر إطلاع الطلاب على نتائج كل الاختبارات أو ما في حكمها وتسليمهم أوراق الإجابة فور تصحيحها وإعلان نتائج هذه الاختبارات بعد رصدها وتسليم نسخة منها للقسم المختص قبل بداية الامتحانات النهائية.

المادة (37) الفرص الاستثنائية

يجوز بقرار من مجلس الكلية بناء على اقتراح من قسم الدراسة والامتحانات منح فرصة استثنائية ولمدة سنة دراسية واحدة لمن تجاوز المدة الدراسية المحددة بالكلية.

كما يجوز إضافة مدة سنة دراسية لمن استنفذ المدة القانونية والاستثنائية ويتوقع تخرجهم خلال هذه المدة بناء على اقتراح قسم الدراسة والامتحانات وموافقة مجلس الكلية كفرصة أخيرة ويعتبر الطالب مفصولا تلقائيا في حالة استنفاد الحد الأقصى المحدد بهذه اللائحة.

المادة (38) مراقبة الامتحانات النهائية

يشكل بقرار من عميد الكلية بناءً على اقتراح من لجنة الدراسة والامتحانات لجنة لتسيير الامتحانات النهائية والإشراف عليها تسمى لجنة الامتحانات والمراقبة تتولى كافة الأمور المتعلقة بسير الامتحانات وتنظيمها وعلى الأخص ما يلي:

1- اصدار جداول المراقبين على الامتحانات النهائية وحصر غيابهم.
2- تسليم واستلام أوراق الإجابة وفق النماذج المعدة لذلك.
3- أي مهام أخرى تكلف بها من قبل عميد الكلية بصفته رئيساً للجنة المراقبة والامتحانات.
4- كافة المهام المنصوص عليها في اللائحة (501) لسنة 2010م.

المادة (39) التغيب عن الامتحانات

كل طالب يتغيب عن الامتحان النهائي في مقرر أو أكثر بدون عذر مقبول يعتبر راسبا وترصد له درجة (صفر)، أما إذا تغيب بعذر يقبله مجلس الكلية فيسمح له بالدخول إلى الدور الثاني ويشترط أن يقدم العذر في مدة لا تتجاوز أسبوع من تاريخ إجراء امتحان المادة المتغيب عنها.

المادة (40) الامتحانات الاستثنائية

يجوز للجنة الامتحانات والمراقبة عقد امتحان للطالب النزيل بالمستشفى أو الموقوف جنائيا في حال توفر الظروف الملائمة لعقد الامتحان خارج الكلية ولا يعتبر إجراء مثل هذه الامتحانات ملزما للجنة الامتحانات.

المادة (41) تصحيح المقرر

يتولى أستاذ المقرر أو وحدة التصحيح الآلي تصحيح الامتحانات الخاصة بالمقرر واعتمادها من مجلس القسم وتسليم النتيجة إلى الدراسة والامتحانات لاعتمادها من مجلس الكلية خلال أسبوع من تاريخ آداء الامتحان النهائي للمقرر.

المادة (42) التقييم والتقديرات

أ. يُقيم آداء الطالب في كل مقرر وفقاً للتقديرات الآتية:

ت	الدرجة (%)	التقدير
1	من 85% إلى 100%	ممتاز
2	من 75% إلى أقل من 85%	جيد جداً
3	من 65% إلى أقل من 75%	جيد
4	من 60% إلى أقل من 65%	مقبول
5	من 35% إلى أقل 65%	ضعيف
6	أقل 35%	ضعيف جداً

ب. لا يعتبر الطالب ناجحاً إلا إذا تحصل على نسبة 60% أو أكثر من مجموع الدرجات في كافة المقررات الدراسية.

المادة (43) التقدير العام

يحسب التقدير العام لنجاح الطالب عن كل سنة على حدة كما هو موضحا بالمعادلة.

$$\frac{\text{الدرجة المتحصل عليها بالمادة (س1)} \times \text{عدد الساعات الدراسية للمادة(س1)}}{\text{المجموع الكلي للساعات للسنة الدراسية}}$$

بالإضافة (+)

$$\frac{\text{الدرجة المتحصل عليها بالمادة (س2)} \times \text{عدد الساعات الدراسية للمادة (س2)}}{\text{المجموع الكلي للساعات للسنة الدراسية}}$$

ويحسب التقدير النهائي للطالب الذي اجتاز جميع المقررات بكلية التقنية الطبية على أساس متوسط تقديراته التي تحصل عليها في جميع السنوات.

المادة (44) الامتحانات النهائية

تجرى الامتحانات العملية النهائية في مواعيد تدريسها الأسبوعية خلال الأسبوع الأخير من الدراسة، في حين تجرى الامتحانات النظرية النهائية بعد نهاية الدراسة مباشرة، وتكون الامتحانات النهائية من دورين (أول وثان) ويسمح للطالب بالدخول إلى امتحانات الدور الثاني مهما كان عدد المواد الراسب بها أو عند وجود ظروف قاهرة يقبلها مجلس الكلية حالت دون التقدم لامتحان الدور الأول، وتنحصر الأسباب القاهرة التي تقبلها لجنة الامتحانات والمراقبة والتي تمنع دخول الطالب للامتحانات النهائية في (الدور الأول) وقبول إعادة الامتحان (بالدور الثاني) في الآتي:

أ- أن يكون الطالب المعني نزيلاً بالمستشفى ولا تسمح حالته بإجراء الامتحان، شريطة أن يتم تبليغ رئيس القسم قبل موعد الامتحان وأن يحضر ما يثبت ذلك.

ب- وفاة أحد أفراد العائلة من الدرجة الأولى (أب، أم، أخ، أخت، ابن، ابنة، زوج، زوجة) شريطة إحضار ما يثبت

ذلك بموجب شهادة وفاة رسمية وأصلية.

ج- وجود سبب قاهر يستحيل معه التقدم للامتحان.

المادة (45) توزيع الدرجات

أ- توزع الدرجات للمقررات التي لا تحتوي على الشق العملي على النحو التالي:

أعمال السنة		الامتحان النهائي	المجموع
النظري 30%	الشفوي والنشاط 10%	%60	% 100

ب- يكون توزيع الدرجات للمقررات التي تحتوي على الشق العملي على النحو التالي:

أعمال السنة 40%			الامتحان النهائي 60%		المجموع
النظري 20%	الشفوي 10%	العملي 10%	النظري 40%	العملي 20%	%100

المادة (46) كراسات الإجابة

يسلم أساتذة المقررات أوراق وكراسات الإجابة للامتحانات النهائية فور تقييمها ورصدها إلى الدراسة والامتحانات بالقسم، ويتولى كل قسم أو لجنة الدراسة والامتحانات بالكلية حفظ أوراق وكراسات الإجابة للامتحانات النهائية بالكلية لمدة سنة كاملة ولا يجوز اعتماد نتيجة أي مقرر ما لم تسلم الكراسات المذكورة.

المادة (47) اعتماد النتائج

يعتمد مجلس الكلية نتائج امتحانات الدور الأول والثاني ويجوز تفويض عميد الكلية باعتماد النتائج بعد توقيعها من الأقسام العلمية والدراسة والامتحانات ومسجل الكلية على أن تسلم نسخة من النتائج المعتمدة لمكتب التسجيل للتوثيق المركزي والموقع الإلكتروني للجامعة.

المادة (48) إعلان النتائج

تعلن نتائج الامتحانات من قبل قسم الدراسة والامتحانات بعد اعتمادها من قبل مجلس الكلية أو عميد الكلية.

المادة (49) مرتبة الشرف

تمنح مرتبة الشرف لكل طالب يتحصل على درجة الإجازة التخصصية (البكالوريوس) من الكلية وفق الشروط الآتية:

1- أنجز متطلبات التخرج في مدة لا تتجاوز أربع سنوات دراسية.
2- لم يسبق إدانته تأديبياً طوال مدة دراسته بالكلية.
3- أن لا يكون منتقلاً من كلية أخرى.
4- أن يكون الطالب حاصلا على معدل عام لا يقل عن 85% ومعدل سنوي لا يقل عن 75% طيلة فترة دراسته.

المادة (50) طلب المراجعة الموضوعية (الطعون)

يجوز للطالب التقدم بطلب المراجعة الموضوعية لأوراق إجابته على ألا تزيد عن مقررين مرة واحدة وفق الإجراءات والضوابط التالية:

1- أن يقدم طلب المراجعة إلى قسم الدراسة والامتحانات بالكلية خلال مدة لا تزيد عن أسبوع من إعلان النتائج.
2- ألا يزيد عدد المواد المتقدم بها الطالب للمراجعة عن مقررين دراسيين.
3- يشكل عميد الكلية لجان للمراجعة الموضوعية بحسب القسم المختص التابع له الطالب وطلبات المراجعة التي يتقدم بها الطلاب على أن تتكون كل لجنة من ثلاثة أعضاء هيئة تدريس على الأقل متخصصين من بينهم أستاذ المقرر.
4- يجوز للطالب المعنى حضور المراجعة.
5- على كل لجنة إعداد تقرير مسبب بالخصوص يقدم لعميد الكلية خلال الفترة التي يحددها قرار التكليف.
6- إذا ثبت صحة ادعاء الطالب تعدل النتيجة وفق النموذج المعد لذلك وتودع نسخة من التقرير في ملف الطالب ويقدم عضو هيئة التدريس (أستاذ المقرر) تبريرا مكتوبا بالخصوص في النموذج المعد.

المـادة (51) الإفادة وكشف الدرجات

يُمنح الطالب الذي استكمل متطلبات التخرج وأنهى فترة الامتياز ومشروع التخرج ما يلي:

أ- كشف درجات باللغتين العربية والإنجليزية مبيناً فيه درجات المقررات الدراسية ووحداتها والمعدل التراكمي والتقدير العام المبين وفق هذه اللائحة.
ب- إفادة تخرج باللغتين العربية والإنجليزية مبيناً فيها حصوله على درجة الإجازة المتخصصة.
ج- إفادة جداريه تعتمد من رئيس الجامعة.
د- شهادة الامتياز تفيد بقضاء الطالب فترة الامتياز بعد أن أنجز كل المقررات الدراسية لنيل الاجازة التخصصية في التقنية الطبية واجتيازه بحث التخرج.

وفي جميع الأحوال يتم إعداد كشوف الدرجات النهائية وإفادات التخرج من قبل قسم الخريجين بمكتب مسجل الكلية ويتم اعتماد كشوف الدرجات وإفادات التخرج والشهادات الجدارية وفق ما نصت عليه المادتين (29،30) من اللائحة (501) لسنة 2010م.

المادة (52) الدور الثاني

يسمح للطالب بدخول الدور الثاني مهما كان عدد المواد التي لم ينجح فيها وترصد للطالب الناجح بالدور الثاني درجته كاملة.

المادة (53) الرسوب وإعادة المقرر

يحق للطالب الراسب في الدور الثاني في أكثر من مقررين من إعادة مقررات الرسوب فقط ويجب عليه حضور المحاضرات نظرياً وعملياً، وينطبق عليه ما ينطبق على طلاب تلك السنة فيما يستحدث من مقررات جديدة أو تغييرات منهجية مختلفة، وفي جميع الأحوال يعفى الطالب الراسب من إعادة دراسة المواد التي سبق نجاحه فيها.

المادة (54) الترحيل

يسمح للطالب بترحيل مادتين أو مقررين فقط من سنة دراسية إلى السنة التي تليها ولا يجوز للطالب الانتقال إلى السنة الثالثة إلا بعد انجاز كل المقررات والمواد الدراسية بالسنة الأولى حتى ولو أنجز كل مواد ومقررات

السنة الدراسية الثانية، كذلك لا يجوز للطالب الانتقال للسنة الرابعة ما لم ينجز كل مقررات السنة الدراسية الثانية حتى ولو انجز كل مقررات السنة الثالثة.

المادة (55) المقررات المرحلة

يجوز للطالب الدخول إلى الامتحان النهائي فقط للمقررات المرحلة بشقيها النظري والعملي سواء كان في الدور الأول أو الدور الثاني وتحسب له الدرجة من 100% فقط إذا كانت المواد المرحلة تتبع السنوات الأولى والثانية والثالثة، ويستثنى من ذلك الطلاب التابعين للسنة الدراسية الرابعة حيث يتحتم على الطالب اعادة مقررات الرسوب من جديد بدرجات أعمال سنة جديدة.

الفصل الخامس: مرحلة الامتياز

المادة (56) التدريب العملي الميداني (الامتياز)

أ- يؤدي الطالب بعد اجتيازه امتحانات السنة النهائية تدريبا عمليا وميدانيا لمدة 24 أسبوعا (ستة أشهر) وفقا للنظام الذي تضعه الكلية والقسم العلمي المختص، داخل الكلية أو خارجها وفي الأماكن والمواعيد والمجالات التي تحددها وذلك تحت إشراف القسم العلمي المختص وتسري أحكام الدراسة والامتحانات على التدريب العملي والميداني الذي يكلف به الطالب.

ب- على الطالب انجاز مشروع تخرج حسب التخصص والقسم العلمي التابع له خلال فترة الامتياز بإشراف أحد أعضاء هيئة التدريس يحدده القسم على أن يتم مناقشة الطالب من لجنة يقترحها القسم العلمي التابع له الطالب ويصدر بها قرار من عميد الكلية.

ج- لا يعتبر الطالب خريجا إلا بعد استكمال مدة التدريب العملي الميداني (الامتياز) وإجازة مشروع تخرجه من قبل اللجنة المكلفة بمناقشة المشروع.

د- يخضع الطلبة الذين أنجزوا كل المقررات الدراسية لنيل الإجازة التخصصية في التقنية الطبية مباشرة بأداء التدريب العملي (الامتياز) وفقا للأحكام المنظمة لمرحلة الامتياز بهذه اللائحة.

هـ- يكون تنفيذ برامج التدريب العملي في المرافق الصحية التعليمية أو البحثية المتخصصة وذات العلاقة بتخصصات الكلية، أو أي أماكن أخرى تحددها الكلية، كما يجوز أداء الامتياز في أي مدينة أخرى وفق ضوابط تحددها الكلية وبناء على اقتراح من القسم العلمي وموافقة مجلس الكلية.

المـادة (57) لجنة التدريب العملي الامتياز

أ-تستحدث بكل كلية وحدة للتدريب العملي برئاسة عضو هيئة تدريس يكلف من قبل عميد الكلية وعضوية عضو هيئة تدريس واحد من كل قسم علمي يرشحه القسم العلمي المختص.

ب-تتولى وحدة التدريب وفق الفقرة السابقة ما يلي:

1- إعداد البرنامج التدريبي وخطة تنفيذه وفق البرامج التعليمية ومقترحات الأقسام العلمية.
2- إعداد جداول توزيع طلبة الامتياز والتدريب العملي خلال سنوات الدراسة على المرافق الصحية التعليمية والمراكز البحثية المستهدفة للتدريب فيها.
3- اقتراح تكليف أعضاء هيئة التدريس للإشراف على الطلبة بالتنسيق مع الأقسام العلمية ذات العلاقة وفق جداول توزيع الطلاب على جهات التدريب.
4- متابعة تنفيذ برامج التدريب العملي بالأقسام العلمية بالكلية.
5- دراسة واعتماد تقارير تقييم الطلبة المقدمة إليها من المكلفين بالإشراف على تنفيذ البرنامج التدريبي.
6- دراسة الشكاوى والصعوبات التي قد تعوق تنفيذ برامج التدريب وتقديم التوصيات بشأن معالجتها.
7- تعتمد محاضر اللجنة المشكلة وفق هذه المادة من مجلس الكلية.

المادة (58) الإشراف على طلبة الامتياز ومشاريع التخرج

يُكلف أعضاء هيئة التدريس المشرفون على طلبة الامتياز من الأقسام العلمية ويُوكل إليهم الآتي:

أ- توجيه الطالب داخل الوحدات والمراكز الصحية والبحثية المراد التدريب بها.
ب- الإشراف على الطالب ومتابعة تدريبه.
ج- متابعة سلوك الطالب أثناء فترة الامتياز.
د- تقييم أداء الطالب وفق البرنامج التدريبي المعتمد وتقديم تقرير بشأنه.
هـ- متابعة والإشراف على مشاريع التخرج وتقديم تقارير دورية بالخصوص على نسبة الانجاز للقسم المختص.

المادة (59) مدة وضوابط الامتياز

أ- تكون مدة التدريب العملي 24 أسبوعا (ستة أشهر).
ب- أن يلتزم الطالب بالتسجيل بالتدريب العملي في المواعيد المعلن عنها.
ج- يجوز تمديد فترة التدريب العملي بقرار من مجلس الكلية بناءً على توصية من لجنة شؤون الامتياز إذا لم يتجاوز غياب طالب الامتياز 25% من مدة التدريب ولمدة تساوي مدة الغياب.
د- يُعيد طالب الامتياز مدة التدريب العملي إذا تجاوز غيابه 25% من مدته المقررة.
هـ- الحضور المستمر وفق التنسيب المعتمد بأحد المرافق الصحية أو المراكز البحثية ذات العلاقة طيلة مدة التدريب.
و- التقيد بتوجيهات وتعليمات الأستاذ المشرف.

الفصل السادس: الإنذار والفصل من الدراسة

المادة (60) الإنذارات

يلفت نظر الطالب وينذر كتابيا في الحالات التالية:

1- إذا لم ينجز أي وحدة دراسية خلال أي سنة دراسية.
2- إذا قل المعدل التراكمي العام للطالب عن 35 % (ضعيف جداً).
3- إذا قل المعدل السنوي عن الحد الأدنى 60% في أي سنة دراسية.
4- إذا انقطع عن متابعة دراسته لأي سبب كان مدة تزيد عن شهراً في العام الدراسي.
5- إذا أخفق في اجتياز أي مقرر للمرة الثانية خلال دراسته.

المادة (61) الفصل من الدراسة بالكلية

يفصل الطالب وينتهي حقه في الدراسة على حساب الدولة في الحالات الآتية:

1) إذا انقطع عن الدراسة لسبب غير مشروع سنة دراسية كاملة.
2) إذا أعيد تنسيبه وتحصل على تقدير عام ضعيف جدا في نهاية أي من العامين الدراسيين الأولين.
3) إذا أعيد تنسيبه ورسب سنتين دراسيتين متتاليتين، أيا كان متوسط تقديره العام.
4) إذا تحصل على تقدير عام ضعيف جدا خلال السنة الأولى.
5) إذا رسب في أي مقرر سنتين متتاليتين بدوريها الأول والثاني.
6) إذا صدر بشأنه قرار فصل من الكلية بناء على قرار صادر من مجلس التأديب.
7) إذا تحصل على إنذارين خلال مدة دراسته بالكلية.
8) إذا استنفذ مدة الدراسة المقررة في المادة (4) من هذه اللائحة.
9) إذا صدر بشأنه قرار فصل من الجامعة أو الكلية بناءً على قرار صادر من مجلس التأديب.

الفصل السابع: المخالفات التأديبية

المادة (62) التحقيق والتأديب

يخضع الطالب للتأديب إذا ارتكب فعلاً يشكل مخالفة للقوانين أو اللوائح والأنظمة المعمول بها في الجامعة، سواء في داخل الجامعة أو في أي مكان من ملحقاتها، بارتكاب فعل تحظره القوانين واللوائح أو الامتناع عن أداء واجب، ويظل الطالب خاضعاً لأحكام التأديب من تاريخ تسجيله بالدراسة وحتى زوال هذه الصفة بتخريجه أو إلغاء تسجيله.

المادة (63) المخالفات

يعد من المخالفات التي يعاقب عليها الطالب ما يلي:

أ- الاعتداء على أعضاء هيئة التدريس أو الطلاب أو العاملين بالجامعة سواء كان لفظيّ أم جسديا أم كتابيا أو بالإشارة.

ب- أعمال الشجار أو الضرب أو الأذى أو السب أو القذف أو التهديد.

ج- الاعتداء على ممتلكات وأموال الجامعة أو المرافق التابعة لها.

د- كل استيلاء أو إتلاف للمعدات أو الأدوات التابعة للجامعة أو إحدى المرافق التابعة لها بإتلافها أو يجعلها ليست صالحة للاستعمال كلياً أو جزئياً وتقع المخالفة سواء تمت بصورة عمديه أو بالإهمال.

هـ- الإخلال بنظام الدراسة والامتحانات.

و- ارتكاب أي سلوك مناف للأخلاق أو يمس النظم والآداب العامة.

المادة (64) الإخلال بنظام الدراسة

يعد من مخالفات الإخلال بنظام الدراسة والامتحانات ما يلي:

1- تزوير المحررات الرسمية مثل الشهادات والإفادات أو الوثائق سواء كانت صادرة عن الجامعة أو عن غيرها إذا كانت ذات صلة بإجراءات الدراسة.

2- انتحال الشخصية سواء لتحقيق مصلحة للفاعل أو لغيره ويعد انتحالا للشخصية دخول طالب أو غيره بدلا عن الممتحن لأداء الامتحان وتسري العقوبة على الطالبين وكل من سهل ذلك أو كان شريكا فيه من الطلاب.

3- إثارة الفوضى أو الشغب وعرقلة سير الدراسة أو الامتحانات بأية صورة كانت.

4- التأثير على الأساتذة أو العاملين فيما يخص سير الامتحانات أو التقييم أو النتائج أو غيرها مما يتعلق بشؤون الدراسة والامتحانات.

5- ممارسة أعمال الغش في الامتحانات أو الشروع فيها بأية صورة من الصور ويعتبر من قبيل الشروع في الغش إدخال الطالب إلى قاعة الامتحانات أية أوراق أو أدوات أو أجهزة تساعد على الغش ذات علاقة بالمنهج الدراسي موضوع الامتحانات ما لم يكن مرخصا بإدخالها من قبل لجنة الامتحانات.

6- الامتناع عن الإدلاء بالشهادة أمام لجان التحقيق أو مجالس التأديب المشكلة وفقا لإحكام هذه اللائحة.

7- أية مخالفة للقوانين واللوائح والنظم المتعلقة بالتعليم العالي.

8-

المادة (65) السلوك ألمناف للأخلاق العامة

يعد سلوكاً منافيا للأخلاق والنظام العام والآداب العامة الأفعال التالية: -

أ- الاعتداء على العرض ولو تم برضا الطرف الآخر وفي حالة الرضا يعد الطرف الآخر شريكاً في الفعل.

ب- خدش الحياء العام بأي صورة كانت.

ج- تداول الأشياء الفاضحة أو توزيعها أو عرضها.
د- تعاطي المخدرات أو المسكرات أو التعامل فيها بأية صورة من الصور.
هـ- الظهور بمظهر غير لائق داخل الكلية أو إحدى مكوناتها وارتداء الأزياء المنافية للحشمة أو المبالغة في الزينة.
و- وفي جميع الأحوال إذا شكل السلوك جريمة جنائية توجب على الكلية إبلاغ الجهات المختصة.
ز- كل ما من شأنه الإخلال بالشرف وفقا للقوانين النافذة والمساس بالآداب العامة والأخلاق.

المادة (66) السلوك المحظور

يعد التعداد الوارد في المواد (64, 65, 66) على سبيل المثال لا الحصر وأي سلوكا محظورا أخر يعتبر مخالفا للتشريعات والنظم المعمول بها في الجامعات والكليات.

الفصل الثامن: العقوبات التأديبية

المـادة (67) الإيقاف عن الدراسة

يعاقب الطالب بالإيقاف عن الدراسة لمدة لا تقل عن سنتين دراسيتين إذا ارتكب أحد الأفعال المنصوص عليها في الفقرات (أ) و (ب) و (هـ) و (و) من المادة (64) من هذه اللائحة، ويفصل الطالب من الكلية إذا تكرر ارتكابه لأحد هذه الأفعال.

المـادة (68) تكرار المخالفات

يعاقب الطالب بالإيقاف عن الدراسة لمدة لا تقل عن سنة دراسية إذا ارتكب أحد الأفعال المنصوص عليها في الفقرتين (ج) و (د) من المادة (64) من هذه اللائحة، وتضاعف العقوبة عند تكرار الأفعال وفى جميع الأحوال لا يحوز عودة الطالب لمواصلة الدراسة إلا إذا دفع قيمة الإضرار التي أحدثها بأموال الجامعة.

المـادة (69) التوقف على الدراسة

1. يعاقب على المخالفات المنصوص عليها في المادة (65) على النحو التالي:
2. يعاقب بالوقوف عن الدراسة لمدة لا تقل عن سنة دراسية ولا تزيد على سنتين دراسيتين كل من ارتكب المخالفات الواردة في الفقرتين (1-2)، ويفصل الطالب من الدراسة فصلا نهائيا عند تكرار الأفعال.
3. يعاقب الطالب بالحرمان من دخول الامتحانات كليا أو جزئيا إذا ارتكب المخالفات المحددة في الفقرتين (3-4)، وفى جميع الأحوال يعتبر امتحانه ملغيا في المادة التي ارتكب فيها المخالفة.
4. يعاقب كل من ارتكب المخالفة الوارد بيانها في الفقرة (5) بإلغاء نتيجة امتحانه في دور واحد على الأقل ويجوز لمجلس التأديب إلغاء امتحانه لسنة كاملة ويفصل الطالب فصلاً نهائيا عند تكرار الفعل.
5. يعاقب على المخالفات المنصوص عليها في الفقرتين (6-7) بالحرمان من حقوق الطالب النظامي أو الإيقاف عن الدراسة مدة لا تزيد على سنة دراسية واحدة.

المادة (70) لجنة المراقبة على الامتحانات

يجوز للجنة المراقبة أو المشرفين على قاعة الامتحان تفتيش الطالب إذا وجدت قرائن تدعو للاشتباه بأن في حيازته أوراقا أو أدوات أو أجهزة لها علاقة بالمقرر موضوع الامتحان، كما يجوز لهم إخراج الطالب من قاعة الامتحان إذا خالف تعليمات لجنة الامتحان أو بدأ في ارتكاب أعمال الغش وفي جميع الأحوال يعتبر امتحانه ملغيا.

المادة (71) مدة التوقف على الدراسة

يعاقب بالوقف عن الدراسة لمدة لا تقل عن سنة دراسية ولا تزيد على سنتين كل طالب ارتكب إحدى الأفعال المنصوص عليها في المادة (66) ويفصل الطالب نهائيا عند تكرار هذه الأفعال.

المادة (72) الحرمان من دخول الامتحان

يترتب على الإيقاف عن الدراسة حرمان الطالب من التقدم إلى الامتحانات طيلة مدة الوقف، ولا يجوز للطالب الانتقال إلى أي كلية أو معهد أخر أثناء سريان مدة العقوبة.

الفصل التاسع: إجراءات التأديب

المادة (73) الإبلاغ عن المخالفة

على كل من يعلم بوقوع مخالفة للقوانين واللوائح والأنظمة المعمول بها في الكليات أو الجامعة أن يقدم بلاغا عن هذه المخالفة يتضمن تقريرا مكتوبا عن الواقعة إلى مجلس الكلية أو الجامعة.

المادة (74) لجنة التحقيق

فور الإبلاغ عن الواقعة يتعين على عميد الكلية تكليف لجنة للتحقيق من ثلاثة أعضاء من هيئة التدريس يكون أحدهم مقررا للجنة وتحال إليها المخالفات من قبل العميد أو الوكيل فور الإبلاغ عنها.

المادة (75) إعلام الطالب بالتحقيق

يتم إعلام الطالب بالتحقيق قبل موعده بيوم كامل على الأقل، ولا يحسب اليوم الذي تم فيه الإعلام، ويجوز أن يتم التحقيق فورا في حالة الضرورة والاستعجال.

المادة (76) تقرير لجنة التحقيق

بعد الانتهاء من التحقيق، أو عند عدم حضور الطالب للتحقيق بالرغم من إعلامه به، يقدم المكلف بالتحقيق تقريره إلى الجهة التي كلفته.

المادة (77) ثبوت المخالفة

في حالة ثبوت المخالفة التي لغرضها شكلت لجنة التحقيق يحال الطالب لمجلس تأديب.

المادة (78) مجلس التأديب

يشكل مجلس للتأديب بقرار من عميد الكلية يتكون من ثلاثة أعضاء من هيئة التدريس من ذوي الخبرة والدراية وبحضور مندوب من اتحاد الطلبة وعضو عن الشؤون القانونية، ويتم إعلام من تمت إحالته على المجلس المذكور بالموعد الذي ينبغي فيه المثول أمامه، وذلك خلال مدة لا تقل عن ثلاثة أيام، ولا يحتسب اليوم الذي تم فيه الإعلام من بينها، وفي حالة تغيب الطالب بعذر مقبول تعطى له فرصة ثانية للمثول أمام المجلس خلال 48 ساعة.

وفى حالة التغيب بدون عذر مقبول يصدر المجلس قراره غيابيا، ولا يجوز لمن اشترك في لجنة التحقيق أن يكون عضوا بمجلس التأديب.

المادة (79) قرارات مجلس التأديب

يصدر مجلس التأديب قراراته بعد سماع أقوال الطالب، ويجوز للمجلس استدعاء الشهود، كما يجوز له استدعاء من قام بالتحقيق.

المادة (80) الإعلان عن موعد التحقيق أو التأديب

يتم الإعلان عن موعد التحقيق أو التأديب بلوحة الإعلانات بالكلية، ويعتبر ذلك قرينة على العلم بذلك.

المادة (81) قرارات مجلس التأديب

يصدر مجلس التأديب قراراته بأغلبية أصوات الأعضاء، ولا تعد نافذة إلا بعد اعتمادها من مجلس الكلية، أما القرارات الصادرة عن المجلس بالفصل فلا تعد نافذة إلا بعد اعتمادها من مجلس الجامعة، وتبلغ كافة الجامعات والمعاهد العليا في ليبيا بالقرار للحيلولة دون تسجيل الطالب المفصول في أي منها.

المادة (82) إعلان قرار مجلس التأديب

يعلن قرار مجلس التأديب بلوحة الإعلانات بالكلية، وتسلم نسخة منه وتودع نسخة ثانية بالملف الشخصي للطالب.

المادة (83) انقضاء الدعوى

تنقضي الدعوى التأديبية بوفاة الطالب أو انسحابه من الكلية ولا يؤثر انقضاء الدعوى التأديبية أو الحكم فيها على الدعاوى الجنائية أو المدنية الناشئة عن الواقعة.

المادة (84) الطعن في قرارات مجلس التأديب

تعتبر قرارات مجالس التأديب التي تصدر طبقا لأحكام هذه اللائحة نهائية بعد اعتمادها، ولا يجوز الطعن فيها إلا بالطرق القضائية المقررة بموجب التشريعات النافذة.

المادة (85) العلاوة السريرية (علاوة الخطر)

تصرف هذه العلاوة لكل أعضاء هيئة التدريس بكليات التقنية الطبية طبقاً للمادة (1) من قرار الأمين المساعد لشؤون الخدمات رقم 326 لسنة 1372 ور. وقرار اللجنة الشعبية العامة رقم 199 لسنة 1369ور بخصوص العلاوة السريرية.

المادة (86) أحكام ختامية

أ. تسري أحكام هذه اللائحة على جميع طلاب كليات التقنية الطبية بالجامعات الليبية وتطبق لائحة الدراسة والامتحانات والتأديب بالجامعات ومؤسسات التعليم العالي الصادرة بالخصوص.

ب. يجوز بناء على مقترح من القسم العلمي القيام بتطوير وتحديث في محتويات المقررات الدراسية بعد موافقة إدارة الكلية ولا تعتبر سارية المفعول إلا بعد اعتمادها من إدارة الجامعة ولجنة كليات التقنية الطبية بالجامعات الليبية، ويصبح التعديل ساريا مع بداية العام الجامعي التالي.

ت. يجوز لإدارة الكلية وضع آلية لمتابعة تقييم المناهج والمقررات الدراسية وفقا لما تقتضيه التطورات العلمية.

ث. أي تغيير أو إضافة لمواد هذه اللائحة هو من اختصاص إدارة الكلية، على أن يتم اعتماده من الجهات المختصة وإدارة الجامعة ولجنة كليات التقنية الطبية بالجامعات الليبية حسب القوانين واللوائح المنظمة لذلك.

ج. تعتبر هذه اللائحة جزء لا يتجزأ من لائحة الدراسة والامتحانات والتأديب بالجامعات ومؤسسات التعليم العالي الصادرة بالخصوص في نطاق الكلية.

ح. يعمل بأحكام هذه اللائحة من تاريخ اعتمادها من قبل جهات الاختصاص.

خ. مرفق مع هذه اللائحة المقررات والوحدات الدراسية الخاصة بالأقسام العلمية بكليات التقنية الطبية بالجامعات الليبية الدراسية لمدة الدراسة بالكلية.

المادة(87) تعديل أحكام اللائحة

يجوز تعديل الأحكام الواردة في هذه اللائحة بالإضافة أو الإلغاء وفقاً للتشريعات النافذة.

مادة (88) سريان أحكام اللائحة

تسري أحكام هذه اللائحة اعتباراً من تاريخ اعتمادها على الطلاب المسجلين بكليات التقنية الطبية، وتسري أحكام لائحة تنظيم التعليم العالي الصادرة بقرار اللجنة الشعبية العامة "سابقاً " رقم (501) لسنة 2010م على كل ما لم يرد بشأنه نص في هذه اللائحة، ولا يسري أي حكم يخالفها.

يعتمد /

تاريخ الاعتماد::..../.../...../2022 م

المقررات الدراسية

أولا: المقررات الدراسية للسنة الأولى بجميع أقسام كليات التقنية الطبية

اللغة العربية

1	اسم المقرر الدراسي	اللغة عربية
2	رمز المقرر	MT101
3	طبيعة المقرر : عام/تخصص/اختياري	عام
4	عدد الوحدات المعتمدة	2
5	عدد الساعات التعليمية	ساعتان اسبوعيا
6	المتطلبات المطلوبة مسبقا	--------
7	البرنامج التعليمي الذي يُقدم المقرر	إدارة البرنامج تكلف استاذ
8	لغة التدريس	العربية
9	تاريخ اعتماد المقرر	2022

وصف موجز للمقرر	التعريف بالمقرر الدراسي وما يتضمنه من مواضيع للتعريف بطبيعة المقرر * الكلام وما يتألف منه. * أقسام الكلمة ومميزات كل قسم منها. * الفعل وأحواله. *همزة الوصل والقطع تعريفها ومواضعها. *علامات الترقيم أشكالها أهميتها واستعمالها. * الكتابة وأنواعها وكيفية كتابة التقرير العلمي. *الحذف والزيادة في الحروف. *التاء المربوطة والتاء المفتوحة. * اللام الشمسية واللام القمرية.
الكتب المقررة	عنوان الكتاب المقرر: فن الكتابة الصحيحة (قواعد الإملاء، علامات الترقيم، لغة الإعلانات الصحفية الأخطاء الشائعة) محمود سليمان 2003م ،دار المعرفة الجامعية، مذكرات المقرر: ملخص بحثي من عدة مصادر /مكان تواجدها مصور الكلية. موارد إضافية: 1_لالِيء الإملاء محمد مامو 2008م 2 _قواعد الإملاء، عبد السلام هارون 1993. 3_قواعد اللغة العربية مبارك مبارك ط3 1992. 4_ المرشد في الإملاء والترقيم والتحريرالعربي، محمود شاكر سعيد 5_الواضح في النحو وتطبيقاته نادية رمضان النجار ج1،ط1، 2000. 6_ملخص قواعد للغة العربية،فؤاد نعمة،ط19. يمكن استخدام كتب اضافية وبحوث وروابط لمواضيع من الإنترنت وفقا لتقدير استاذ المقرر.
المدة الزمنية للمقرر	28 * 2 = 56 ساعة تدريس
طريقة التدريس	تعتمد الأساليب والطرق المستخدمة في تدريس المقرر على الاتي: عن طريق المحاضرات التدريبات والتمرينات حلقات نقاش. ورقات بحثية
الأهداف والمستهدف من المقرر	بدراسة المقرر، سيكون الطالب قد أثبت بشكل موثوق القدرة على أن: 1. حفظ لسانه من الخطأ النحوي والاعرابي.

	2. بتعرف الطالب الشعر العربي وتذوقه 3. يميز اللغة العربية والتدريب على فهمها باعتبارها اللغة الام 4. يكتب الكتابة السليمة والخالية من الأخطاء اللغوية. 5. يعرف على أهم القواعد النحوية وتعلم النطق الصحيح نحويا. 6. يبيين التحليل اللغوي في اللغة العربية وطريقة التعبير السليم.
طريقة التقييم	الامتحان النصفي الأول 10%. الامتحان النصفي الثاني 20 %. الواجبات المنزلية + ورقة عمل 10%. الامتحان النهائي 60%. درجة النجاح: 60%
محتويات المقرر	**محتوى المقرر الدراسي**
الأسبوع (1)	المواضيع التي سيتم تغطيتها في الأسبوع • مفهوم اللغة وأهميتها.
الأسبوع (2)	المواضيع التي سيتم تغطيتها في الأسبوع *الكلام وما يتألف منه (الكلام_ الكلم _القول) * تدريبات
الأسبوع (3،4)	المواضيع التي سيتم تغطيتها في الأسبوع *الكلمة وأقسامها *مميزات كل قسم (الاسم _الفعل _الحرف) *تدريبات
الأسبوع (5	المواضيع التي سيتم تغطيتها في الأسبوع *الجملة وأنواعها. *تدريبات
الأسبوع (6، 7)	المواضيع التي سيتم تغطيتها في الأسبوع *الفعل الصحيح والفعل المعتل. *الفعل المجرد والفعل المزيد. *تدريبات
الأسبوع (8_9)	المواضيع التي سيتم تغطيتها في الأسبوع *الكتابة أهميتها وأنواعها *الأسلوب أنواعه وخصائصه *تدريبات
الأسبوع (10)	المواضيع التي سيتم تغطيتها في الأسبوع *الكتابة الوظيفية(أنواعها) *تدريبات
الأسبوع (11-12)	المواضيع التي سيتم تغطيتها في الأسبوع *التقرير العلمي (مفهومه _مكوناته -خطواته) *كيفية كتابة التقرير العلمي *تدريبات
الأسبوع(13)	المواضيع التي سيتم تغطيتها في الأسبوع *علامات الترقيم وأهميتها في الكتابة *تدريبات كتابية
الأسبوع (12)	المواضيع التي سيتم تغطيتها في الأسبوع *اختبار نصف النصفي.
الأسبوع (13)	المواضيع التي سيتم تغطيتها في الأسبوع *التاء المربوطة والتاء المفتوحة. *تدريبات
الأسبوع (14)	المواضيع التي سيتم تغطيتها في الأسبوع *اللام الشمسية واللام القمرية. *تدريبات

حكومة الوحدة الوطنية
وزارة التعليم العالي والبحث العلمي
الوزير

الأسبوع (15)	المواضيع التي سيتم تغطيتها في الأسبوع *الهمزة في أول الكلمة (همزة القطع والوصل) *تدريبات
الأسبوع (16)	الامتحان النصفي
الأسبوع (17)	المواضيع التي سيتم تغطيتها في الأسبوع *علامات الإعراب الأصلية والفرعية *تدريبات
الأسبوع (18)	المواضيع التي سيتم تغطيتها في الأسبوع *علامات الإعراب الأصلية والفرعية *تدريبات
الأسبوع (19،20)	المواضيع التي سيتم تغطيتها في الأسبوع *التحليل اللغوي للنص (نماذج مختارة) *طرق كتابة الهمزة في وسط الكلمة وآخرها *تدريبات
الأسبوع (21، 22)	المواضيع التي سيتم تغطيتها في الأسبوع *زيادة الألف بعد واو الجماعة *زيادة ألف تنوين الفتح
الأسبوع (23، 24)	المواضيع التي سيتم تغطيتها في الأسبوع *حذف النون من آخر الكلمة *حذف الياء من اخر الكلمة
الأسبوع (25، 26)	المواضيع التي سيتم تغطيتها في الأسبوع *نماذج للكتابة الوظيفية *تدريبات كتابية
الأسبوع (27)	المواضيع التي سيتم تغطيتها في الأسبوع مراجعة
الأسبوع (28)	المواضيع التي سيتم تغطيتها في الأسبوع مراجعة
الأسبوع 29(- 30)	**الامتحان النهائي**
الحضور والغياب	يجب على الطلاب حضور كل المقرر الدراسي في الوقت المحدد ، ولا يسمح بالتغيب إلا لأسباب طبية ويجب دعمه بتقرير طبي.
مهارات عامة	تلتزم الكلية بضمان حصول الطلاب على كامل المعرفة والمهارات اللازمة للمشاركة الكاملة في جميع جوانب حياتهم، بما في ذلك المهارات التي تمكنهم من أن يكونوا متعلمين مدى الحياة. لضمان حصول الخريجين على هذا الإعداد، سيتم تضمين مهارات عامة مثل الكمبيوتر والاتصالات الشخصية ومهارات التفكير . *تنمية مهارة فهم الأسئلة من خلال المناقشة اليومية والامتحانات وطرق الإجابة. *أن يكتسب الطالب مهارات التعلم الفعال بالمشاركة الفعلية في الدرس. *أن يكتسب الطالب روح العمل الجماعي في البحث والنقاش. *أن يتدرب الطالب على التفريق بين المفردات والألفاظ اللغوية والتراكيب النحوية وتوظيفها حسب معناها. *تدريب الطالب على البحث وكيفية الحصول على المعلومات من المصادر والمراجع بأسهل طرق ممكنة.
التغيير والتعديل في المقرر الدراسي	المعلومات الواردة في مخطط المقرر الدراسي هذا صحيحة وقت النشر. وينقح محتوى المقررات الدراسية على أساس مستمر لضمان ملاءمتها لتغير العملية التعليمية واحتياجات سوق العمل. وسيسعى أستاذ المقرر إلى تقديم إشعار بالتغييرات للطلاب في الوقت المناسب. ويمكن أيضا تنقيح الجدول الزمني.

Medical Terminology

1	**Course name**	**Medical Terminology**
2	**Course Code**	**MT102**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the grammar skills, nouns, pronouns, verbs, prepositions and knowledge about medical terms and improve student overall use of the language and their ability to communicate in English. The course is designed to cover the essential knowledge of different topics such as, terminology of medical technology fields, how to write medical report. Also, the course aims to introduce the use important affixes in medical technology practice.
Textbooks required for this Course:	• L. Sophie Tecklin, Jan Stephen, Medical Terminology for Health Professors. Ann Ehrlich, Carol L Schroeder. • Medical Terminology: A Short Course 9th Edition Davi-Ellen Chabner eBook ISBN: 9780323824484, 2022. • Medical Terminology: A Short Course / Edition 8 by Davi-Ellen Chabner BA, MAT ISBN-13: 9780323444927, 2017. • English for Medicine in Higher Education Studies – 2nd Edition Course Book byPatrick Fitzgerald, Marie McCullagh, Ros Wright ISBN: 9781782607625, 2021 • English for Medicine in Higher Education Studies Course Book with audio CDs by Patrick Fitzgerald, Marie McCullagh, Ros Wright, Terry Phillips ISBN: 9781859644423, 2010. • English Grammar in Use (R. Murphy; Cambridge University Press) • Exploring Grammar in Writing -- upper-intermediate and advanced (R. Hughes; Cambridge University Press) • Oxford Guide to English Grammar (J. Eastwood; Oxford University Press) • Academic Vocabulary in Use (M. McCarthy and F. O'Dell; Cambridge University Press) • Links to a number of useful grammar websites can be found in the website Using English for Academic Purposes

	www.uefap.com, maintained by Andy Gillett (from the UEfAP home page, select Links, then Language). • http://www.etymonline.com/abbr.php • http://laits.utexas.edu/sites/medterms/esstential-terms/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2*28 =56 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	To Empowering students and helping them to store and memorize the largest possible amount of medical terms used in hospitals and other health facilities. To acquire a general knowledge about medical technology and biomedical sciences lexicon. To give students an introduction to the English terminology of medical and biomedical sciences. To improve students overall use of the language. To master specific vocabulary and idioms. To improve their ability to communicate in English. To be introduced to the different topics such as, medical technology related subjects such as anatomy, physiology, immunology, microbiology and first aid that the students will study comprehensively the next years. To ease the English learning environment process. To be introduced to a vast number of affixes concerning term of medical technology.
Course Assessments	Mid-term exam 20 % Activity 10 % Attendances 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1)	Introduction to Medical terminology
Session 2 (Week 2)	• Parts of speech & Tenses (Review). • Prepositions & Usage.
Session 3 (Week 3)	• Conjunctions, Sentence-Linkers & their uses.
Session 4 (Week 4)	• Interchange of Active & Passive Voice. • Direct & Indirect Speech. • Words often confused.
Session 5 (Week 5)	• Reading Comprehension. • Selecting & Writing Short Answers. • Summarizing.

Session 6 (Week 6)	• Some Commonly Used Proverbs Of The English Language And Their Explanation.
Session 7 (Week 7)	• Paragraph – Writing.
Session 8 (Week 8)	• General Topics. • Topics Related To Science & Medicine
Session 9 (Week 9)	• Some Proverbs & Their Expansion Into A Paragraph.
Session 10 (Week 10)	• Letter – Writing. • Letter Of Application. • Preparation Of Bio-Data.
Session 11 (Week 11& 12)	• Formation Of Compound Words (Root Words, Prefixes & Suffixes). • Root Words, Prefixes & Suffixes Used In The Medical Field With Special Emphasis On Body Parts & Organs. • Terms Without Clear Root Words.
Session 12 (Week 13)	• Specialists, Specialties & Formation Of Their Adjectives Using Suffixes. • Prefixes & Suffixes Used To Indicate Surgical Procedures.
Session 13 (Week 14)	• Prefixes And Suffixes Used To Indicate Instruments, Machines & Techniques Used In The Diagnostic Field. • The Basis Of Medical Terminology Used
Session 14 (Week 15)	• Commonly Used Medical Abbreviations. • The Relationship Of Medical Terminology To Hospital Management
Session 15 (Week 16)	• Understand The Basic Health Terminology Used • Terminology Of Some Common Diseases & Conditions.
Session 16 (Week 17)	**Midterm Exam**
Session 17 (Week 18)	• Knowing The Basis Of Compound Terms • Knowing The Basis Of The Parts And Functions Of The Various
Session 18 (Week 19)	• Organs of The Body • Medical Abbreviations
Session 19 (Week 20)	• Laboratory Acronyms • Diagnostic Acronyms
Session 20 (Week 21)	• Reflexe Activity Testing • Cerebral Palsy
Session 21 (Week 22)	• Muscular • Torticollis
Session 22 (Week 23)	• Clubfoot • Deformities
Session 23 (Week 24)	• Developmental • Dysplasia Of The Hip
Session 24 (Week 25)	• Spina Bifida • Muscular
Session 25 (Week 26)	• Dystrophy • Duchenne Muscular Dystrophy
Session 26 (Week 27)	• Down Syndromes • Congenital Abnormalities

Session 27 (Week 28)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Computer Applications

1	**Course name**	**Computer Applications**
2	**Course Code**	**MT103**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• Fundamentals of Computing and Programming 2010. • Computer Applications: The Beginner's Guide by Michael Edafe 2020, ISBN-13 : 979-8563103450. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	(3*28 = 84 traching hourshours)
Delivery	• Lectures • Problem based learning

	• Class discussion.
Course Objectives:	• Learn the basics of computer science and its physical parts and their functions. • Learn about computer networks and security systems. • Getting acquainted with one of the useful applied programs in the field of specialization and training on it in practice. • Work effectively with a range of current, standard, Office Productivity software applications. • Evaluate, select and use office productivity software appropriate to a given situation. • Apply basic adult learning and assessment principles in the design, development, and presentation of material produced by office productivity applications. • Demonstrate employability skills and a commitment to professionalism. • Operate a variety of advanced spreadsheet, operating system and word processing functions. • Solve a range of problems using office productivity applications, and adapt quickly to new software releases. • Maintain quality assurance through critically evaluating procedures and results.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1)	Introduction and history of computer sciences
Session 2 (Week 2)	Computer definition, advantages, disadvantages, main computer parts.
Session 3 (Week 3)	Operating systems, application software, and programming languages
Session 4 (Week 6 -7)	Algorithms, types and classifications of programming language
Session5 (Week 8 - 10)	Basic concepts of computer networks, and the physical parts of networks
Session6 (Week 11)	Basic concepts of information security
Session 7 (Week 12 -13)	Windows Principles
Session 8(Week 14 -16)	Working with M-office: Practical lessons on Word
Session 10(Week 16-18)	Practical lessons on Power Point
Session 11(Week 19)	**Med term exam**
Session 12(Week20-21)	Practical lessons on M-office Exce
Session13(Week 22-25)	Internet and e-mail. (classroom, drive, meeting).
Session 14 (Week 26)	The relationship of the computer and its applications in the field of medicine and health care
Session 15 (Week 27)	The use of computers in medicine (its advantages and disadvantages).
Session 16 (Week 28)	Samples of modern and advanced medical devices
Session17 (Week29)	Revision and discussion
Session18(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is

	dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physics

1	**Course name**	Physics
2	**Course Code**	MT104
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English language
9	**Date of course approval**	2022

Brief Description:	The course will provide the student with an introduction to the basic concepts of physics and its relation with physical pharmacy; also it concentrates on the basic physics of biomedical imaging, and provide a broad insight into the applications of physics in medical technology; this includes the biomechanics, bioelectricity, waves, optics, liquids and its dynamics.
Textbooks required for this Course:	• Essential Physics, John Ball *et al.* Third edition • General Physics for Medical Sciences Students By Dr. Hasan Maridi • Lecture notes for General Physics 219 Martin Kruczenski Department of Physics, Purdue University, 525 Northwestern Avenue, W. Lafayette, IN 47907-2036. • https://physics.uwo.ca/~tpoeppin/documents/Phys2600_MedPhys_Syllabus_2009.pdf • https://web.ics.purdue.edu/~markru/courses/PHY219/Phys_219_notes.pdf

	• Physics of the Human Body (Biological and Medical Physics, Biomedical Engineering) • file:///C:/Users/BMI/Downloads/Physics%20of%20the%20Human%20Body%20(Biological%20and%20Medical%20Physics,%20Biomedical%20Engineering)%20(%20PDFDrive%20).pdf • Intermediate Physics for Medicine and Biology, 4th Edition (Biological and Medical Physics: Biomedicalby Russell K. Hobbie & Bradley J. Roth 2007 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem solving and homework ,Tutorials Class discussion, Lab experiments ,Practical Demonstrations
Course Objectives:	Upon successful completion of this course students will be able to: • Understand the basics of general and medical physics • Describe the importance of physics in pharmacy and medical technology. • Compare and contrast the medical imaging techniques that are available in • a hospital setting and explain their relative merits • Describe sensing and therapeutic applications of physics in medical technology. • Understand the following: • Mathematic units, relation of physics with the biological sciences. • Biomechanics. • Liquids. • Dynamics of fluids. • Bioelectricity. External senses
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to physics
Session 2 (Week 2, 3& 4)	❑ Measurements Measuring things Three basic units: Length, Mass, Time SI units Unit conversion Dimension
Session 3 (Week 5& 6)	❑ Vectors Vectors and scalars Describe vectors geometrically Components of vectors Unit vectors

	Vectors addition and subtraction
Session 4 (Week 7, 8 & 9)	❑ **Mechanical** • Movement in one dimension: speed, acceleration, and free fall • Dynamics: Newton's first law, Newton's second law, Newton's third law, weight and mass, applications to Newton's laws, the force of friction. • Work and Energy: Work exerted by a constant force, kinetic energy and potential energy
Session 6 (Week 10)	• Density
Session 7 (Week 11)	• Pressure, Pressure in fluids, atmospheric pressure, Pascal's rule and Archimedes' rule
Session 7 (Week 12)	• Surface tension and pressure difference in bubbles capillary property
Session 7 (Week 13)	• Viscosity
Session 7 (Week 14)	• Fluids in motion - Continuity equation - Bernoulli equation - Applications to Bernoulli's equation
Session 7 (Week 15)	• Flexibility, stress, types of stress (tensile), compression, Young's modulus
Session 7 (Week 16)	**Med term Exam**
Session 7 (Week 17)	**Temperature and thermal expansion** • Heat, temperature and thermal equilibrium • Temperature scales (Celsius, Fahrenheit, Kelvin) • Thermal expansion (longitudinal expansion, surface expansion, volumetric expansion
Session 7 (Week 18)	□ **The amount of thermal drift** ▪ Heat capacity and heat specificity ▪ amount of energy, phase change, latent heat ▪ retention of energy.
Session 7 (Week 19)	□ **Transfer of thermal energy** ▪ Conductive heat transfer ▪ Conductive heat transfer ▪ Convection radiant heat transfer
Session 7 (Week 20)	❑ **Wave classification:** • Mechanical transverse and longitudinal, simple non-mechanical harmonic motion, harmonic oscillator, transverse wave propagation, harmonic waves and standing waves.
Session 7 (Week 21)	❑ **Sound** • The nature of sound waves, the spectrum of sound, the velocity of sound waves in a solid and in a gas. Pressure amplitude, sound wave intensity, density level, beats, resonance, Doppler effect.
Session 7 (Week 22)	❑ **The light** • The speed of light, the concepts of waves and rays, Heigen's principle, refractive index, laws of reflection and refraction, total reflection, critical angle, prism.
Session 7 (Week 23)	❑ **Reflection and refraction**

	• Reflection from a plane, principle of rays, reflection from a spherical surface, refraction through planar and spherical surfaces, thin lenses, lens equation.
Session 7 (Week 24)	❑ **Optics** • Interferometry: Definition of Interferometry •Diffraction
Session 7 (Week 25)	❑ **X-ray** • Definition, Its properties, production, x-rays in medicine
Session 7 (Week 26)	❑ **Lasers:** • An Introduction to Laser Discovery
Session 7 (Week 27, 28 & 29)	• The structure of the atom • Isotopes • Nuclear Stability • Types of Radiation • Half-lives
Session 16 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Chemistry

1	**Course name**	Chemistry
2	**Course Code**	MT105
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course will provide the student with a fundementals and basic understanding for general and organic chemistry, chemical structural formulas and how to name it, and its physical and chemical properties, some methods of preparation and its uses. **General chemistry/** recognize the units of measurement for the material – article classification – atomic theory – Periodic Table – isotopes – chemical formulas – chemical calculation – Quantum numbers – Pauli Exclusion Principle – Hund' s rule – physical properties of atoms. **Practical chemistry/** identification of acid radical (anion) in sample salts and identification of basic radical (cation) in sample salts.
Textbooks required for this Course:	• Organic Chemistry by Morrison and Boyd, fifth edition • Chemical Principles by William L. Masterton.; Emil J. Slowinski.; Conrad L. Stanitski.; Fifth Edition • Wilson & Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry by John Block & John M. Beale, eleventh edition. • https://www.durhamtech.edu/sites/default/files/course_outlines/CHM251_0.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor موارد إضافية/ - الكيمياء العامة المبادئ والبنية، جيمس برادي و جيرارد هيومستون, الجزء الأول ، مركز الكتب الاردني . - وأصول الكيمياء العضوية ، عادل احمد الجرار، الطبعة الثانية 1990.مركز الكتب الأردني - والكيمياء العضوية ، ت. و. جراهام سولومونز ، الجزء الأول 1991. مركز الكتب الأردني.
Course Duration	4*28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of basic principles of general and organic chemistry and how they relate to everyday experiences.

	• Demonstrate the laboratory study of the physical and chemical properties of matter; the principles and applications of gravimetric, volumetric, chemical, and quantitative analysis • Gain the basic knowldage about atomic structure, periodic table, chemical equations, gases, liquids, solids, electrolysis, properties of elements and compounds, rates and mechanisms of reactions • Identify all kinds of chemical compounds, its formula and rename it and understand chemical calculation. • Identification of acid radical (anion) and basic radical (cation) in sample salts • Demonstrate problem solving and critical thinking skills • Apply methods of scientific inquiry. • Apply problem solving techniques to real-world problems. • Demonstrate an understanding of the chemical environment and the role that organic molecules play in the natural and the synthetic world • The student should be able to apply information from general chemistry that is relevant to organic chemistry, as well as to recognize the concepts of structure and functional groups in organic chemistry • Understand chemical bonding, hybrid orbitals, molecular geometry, bond energies, polarity, the relationship between structure and physical properties, and acid/base theories. • Recognize, draw and identify examples of each of the major functional groups and classes of organic compounds •
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	- Introduction -Matter and measurements: Base SI units and Derived units
Session 2 (Week 2)	-Kind of substances - classification of substances – states of matter and change in matter.
Session 3 (Week 3)	-Atoms, molecules, and ions – atomic theory – the atomic nucleus – the periodic table – isotopes.
Session 4 (Week 4)	-Molecular masse – Avogadro's number – the mole – mole-gram conversions
Session 5 (Week 5)	-Chemical formula – percent composition from formula – molecular formula from simplest formula. -Identification of acid radical (anion) in sample salts: Group HCl dilute, (carbonate)
Session 6 (Week 6)	-Names of compounds: - ionic compounds and binary compounds of the non-metals.

	-Identification of acid radical (anion) in sample salts: Group HCl dilute, (bicarbonates)
Session 7 (Week7)	-Quantum numbers - periodic table -Identification of acid radical (anion) in sample salts: Group HCl dilute, (sulphite)
Session 8 (Week 8)	-Pauli Exclusion Principle -Capacities of principal levels, sublevels, and orbitals -Electron arrangements in atoms -Electron configuration -Orbital diagrams, Hund's rule -Identification of acid radical (anion) in sample salts: Group HCl dilute, (sulphides)
Session 9 (Week 9)	-Electron arrangements and periodic table -The physical properties of atoms: -Atomic radius -Electronegativity -Identification of acid radical (anion) in sample salts: Group HCl dilute, (thiosulphates)
Session 10 (Week 10)	-Atoms and molecules, a review -Electron structure of the atom -Identification of acid radical (anion) in sample salts: Group HCl dilute, (nitrites)
Session11(Week11)	-Atomic orbitals -Filling the orbitals -Aufbau principle -Identification of acid radical (anion) in sample salts: Group sulphuric acid cons, (chlorides)
Session 12 (Week12)	-Introduction to the chemical bond -An ionic bond -A covalent bond -Lewis formulas -Valence -Identification of acid radical (anion) in sample salts: Group sulphuric acid cons, (bromides)
Session13(Week13)	-Chemical formula in organic chemistry: -An empirical formula -A molecular formula -A structural formula -Complete structural formulas -Condensed structural formulas -Identification of acid radical (anion) in sample salts: Group sulphuric acid cons, (iodides)
Session 14 (Week 14)	-Cyclic compounds and polygon formulas -Polar covalent bonds -Bond moments -Dipole moments -Identification of acid radical (anion) in sample salts: Group sulphuric acid cons, (nitrates)
Session15 (Week15)	**Midterm Exam**
Session16 (Week16)	-Attraction between molecules: -Dipole – dipole interactions

	-Van der Waals forces -Hydrogen bonding -Effects of hydrogen bonding - Identification of acid radical (anion) in sample salts: Group miscellaneous, (sulphates) -Identification of acid radical (anion) in sample salts: Group miscellaneous, (phosphates)
Session17 (Week17)	-Orbitals and their role in covalent bonding, hybridization: -Bonding in hydrogen -The sigma bond -Some general features of bonding and anti-bonding of orbitals -Hybrid orbitals of carbon: -Sp^3 hybridization -Identification of basic radical (cation) in sample salts: Group (1)
Session18 (Week18)	-Sp^2 hybridization -Sp^2 hybridization -Identification of basic radical (cation) in sample salts: Group (2A)
Session19 (Week19)	-Sp hybridization -Effect of hybridization on bond lengths -Identification of basic radical (cation) in sample salts: Group (2B)
Session20 (Week20)	-Functional groups -Carbonyl compounds -Identification of basic radical (cation) in sample salts: Group (3)
Session21 (Week21)	-Structural isomerism, nomenclature, and alkane -Structural isomers -How organic nomenclature developed -A survey of organic nomenclature -Continuous- chain alkanes -Cycloalkanes-side chains or branch -Branched side chains -Multiple branches -Other prefix substituents -Identification of basic radical (cation) in sample salts: Group (4)
Session22 (Week22)	-Nomenclature: -Alkenes and alkynes, alcohols and amines, aldehydes and ketones -Carboxylic acids, esters, and benzene compounds -Conflicts in numbering Alkanes: -Physical properties of alkanes -Chemical properties of alkanes -Halogenation and combustion -The hydrocarbon resources -Identification of basic radical (cation) in sample salts: Group (5)
Session23 (Week23)	Stereochemistry -Geometric isomers -Conformations of molecules

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	-Geometric isomerism in alkenes -Geometric isomerism in cyclic compounds -Conformations of open-chain compounds -Identification of basic radical (cation) in sample salts: Group (6)
Session24 (Week24)	-Alkenes and alkynes -Bonding in alkenes and alkyne, acidity of alkynes -Nomenclature of alkenes and alkynes: IUPAC and trivial names -Physical properties of alkenes and alkynes -Preparation of alkenes and alkynes -Preparation of alkenes from primary alkyl halides -Preparation of alkenes from secondary alkyl halides -Preparation of alkenes from tertiary alkyl halides -Preparation of alkynes from the elongation reaction of shorter chain alkynes -Preview of addition reaction -Addition of hydrogen halides to alkenes and alkynes Markonikov's rule
Session25 (Week25)	-Alcohols, ethers and related compounds -Physical properties of alcohols and ethers -Boiling points -Solubility in water -Nomenclature of alcohols: -IUPAC names of alcohols -Trivial names of alcohols -Classification of alcohols
Session26 (Week26)	-Nomenclature of ethers -IUPAC names of ethers -Trivial names of ethers -Preparation of alcohols -Nucleophilic substitution reaction -Reduction of carbonyl compounds -Laboratory oxidation of alcohols -Preparation of ethers -Williamson ether synthesis -Use of alcohols and ethers in synthesis
Session27 (Week27)	Aldehyde and ketones -Nomenclature of aldehydes and ketones (IUPAC and trivial names) -Preparation of aldehydes by: oxidation primary alcohols -Preparation of ketones by: oxidation secondary alcohols and by Friedal-Crafts acylation reaction -The carbonyl group -Physical properties of aldehydes and ketones: boiling point and solubility in H_2O -Addition of reagents to the carbonyl group Reactivity of aldehydes and ketones
Session28 (Week28)	-Carboxylic acids: IUPAC names and trivial names -Physical properties of some carboxylic acids: Boiling points and solubility
Session29 (Week29)	-Preparation of carboxylic acids: -Hydrolysis of the derivatives of the carboxylic acids -Oxidation of primary alcohols and aldehydes

(Week29)	Revision and discussion with students (answering questions)
Session 28 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biology

1	**Course name**	Biology
2	**Course Code**	MT106
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course covers the principles of biology. It also gives general information about human body, It also covers the laboratory safety issues and the important precautions needed to be taken before, during, and after finishing the laboratory work. This course also covers knowledge of cell structure and its divisions, how traits are passed on from one generation to another, and the different tissues in the body and the systems that make up the human body, as well as knowledge of the classification of the animal kingdom.
Textbooks required for this Course:	• Integrated principle of Zoology. ELEVENTH EDITION, WILLIAM C. OBER, M.D. and CLAIRE W. GARRISON, R.N. • Richard Dawkins3 zoologist and biology popularizer • General Biology by Paul Doerder, Ralph Gibson 2015 • General Biology by Paul Doerder, et al,2013

	• General Biology II: Organisms and Ecology Paperback – May 17, 2017 by Dennis Holley • General Biology I: Molecules, Cells and Genes Paperback – May 4, 2017 by Dennis Holley • https://www.researchgate.net/publication/337635933_Integrated_Principles_of_Zoology_Hickman_14th_edv1-2#fullTextFileContent • https://pdfcoffee.com/hickman-zoology-14th-edpdf-4-pdf-free.html • https://biology.org.ua/files/lib/Raven_Johnson_McGraw-Hill_Biology.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed activities.
Course Objectives:	Students who successfully complete this course will be able to: • Understand the basics of biology. • Be able to understand and differenciate between animal, plant and microorganism's cells and their structure • Describe levels of organization and related functions in plants and animals. • Know and understand the types of tissue found in humans • Understand the types of systems found in humans • Identify the characteristics and basic needs of living organisms and ecosystems. • Explain the processes of growth and development in individuals and populations. • Design and critically assess the scientific investigations they perform. • Demonstrate critical thinking skills • Able to classify the Animal kingdom.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1)	Introduction of the cell and methods studied- Cell theory
Session 2 (Week 2)	Cell structure –organic compounds
Session 3 (Week 3)	Cell membrane
Session 4 (Week 4)	Transport mechanisms
Session 5 (Week 5)	Endoplasmic reticulum- mitochondria – Golgi complex – lysosomes
Session 6 (Week 6)	Microtubules – microfilaments – vacuoles
Session 7 (Week7)	Nucleus –nucleolus – DNA- types RNA
Session 8 (Week 8)	Cellular metabolism (Aerobic & anaerobic)
Session 9 (Week 9)	Cell cycle –Mitosis -
Session 10 (Week 10)	Meiosis – gametogenesis

Session11(Week11)	Mendel's laws (Monohybrid &Dihybrid crosses)
Session 12 (Week12)	Histology, definition and organization of cell to from tissues
Session13(Week13)	Epithelium tissues
Session 14 (Week 14)	Connective tissue
Session15 (Week15)	Muscular tissue
Session16 (Week16)	Med-term Exam.
Session17 (Week17)	Nervous tissue
Session18 (Week18)	Integumentary system
Session19 (Week19)	Muscular system
Session20 (Week20)	Skeletal system
Session21 (Week21)	Digestive system
Session22 (Week22)	Respiratory system and Excretory system
Session23 (Week23)	Cardiovascular system
Session24 (Week24)	Endocrine system
Session25 (Week25)	Nervous system
Session26 (Week26)	Reproductive system
Session27 (Week27 & 28 & 29)	Classification of Animal Kingdom
Session 28 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biostatistics

1	**Course name**	**Biostatistics**
2	**Course Code**	**MT107**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course covers the basic principles, knowledge, understanding of biostatistics, and different type of statistical distributions with gaining the required skills to compare between different statistical tests applying the most suitable statistical test related to the problem under study.
Textbooks required for this Course:	• Biostatistics with R an Introductory Guide for Field Biologists Jan Lepš 2020 • Introductory Biological Statistics, Third Edition Raymond E. Hampton, John E. Havel 2018 • https://books.google.com.ly/books?id=RzpFKbU62u4C&printsec=frontcover&hl=ar&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor • الاحصاء والاحتمالات بين النظرية والتطبيق موارد إضافية: يمكن استخدام كتب اضافية وبحوث وروابط لمواضيع من الإنترنت وفقا لتقدير استاذ المقرر
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	**Upon completion of this course, the student will have reliably demonstrated the ability to:** • Enable the student to know the importance of statistics and its relationship to other sciences • To develop basic statistical analysis skills required in sciences and research. • Acquiring the basic knowledge and understanding biostatistics and different type of statistical distribution. • Gaining the required skills to compare between different statistical tests and applying the most suitable statistical test related to the problem under study. • To enable the students to identify the measures of dispersion and identify the methods of calculating the correlation coefficient and regression • understand random variables and their probability distributions
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**

Session 1 (Week 1)	• Basic Definitions
Session 2 (Week 2)	Uses of Biostatistics in health services. •
Session 3 (Week 3)	Tabulation and graphic representation of data. •
Session 4 (Week 4)	Measures of central tendency and measures of dispersion for grouped • and ungrouped data. a. The range. b. The variance and the standard deviation
Session 5 (Week 5)	c. The coefficient of variance. d - Number of class intervals. f- Width of class intervals.
Session 6 (Week 6)	Probability: definition, addition and multiplication laws of probability. •
Session 7 (Week7)	• Permutations and combinations.
Session 8 (Week 8)	•Introduction and application of binomial and Poisson distributions including the fitting of binomial distribution
Session 9 (Week 9)	•Normal distribution.
Session 10 (Week 10)	• Simple correlation and regression
Session11(Week11)	• Ideas of probability sampling.
Session 12 (Week12)	• Variable. a. Quantitative variable. b. Qualitative variable.
Session13(Week13)	• Variable. c. Random variable. d. Discrete Random variable. e. continuous random variable.
Session 14 (Week 14)	• Random Sampling.
Session15 (Week15)	• Sampling with replacement and without replacement.
Session16 (Week16)	**Midterm Exam**
Session17 (Week17)	• Sampling with replacement and without replacement. Sampling .distributions at: (1) Sample Proportion
Session18 (Week18)	) Difference of two sample proportions for large samples.2 (
Session19 (Week19)	• Testing of hypothesis.
Session20 (Week20)	• Basic concepts.
Session21 (Week21)	1 • Uses of normal test and T-test in testing about a single mean.
Session22 (Week22)	2 • Uses of normal test and T-test in testing about a single mean.
Session23 (Week23)	• Difference of two means.
Session24 (Week24)	• A single proportion and difference of two proportions.
Session25 (Week25,26.27,28)	Paired comparisons and X^2 test for independence. • Review for lectures
(Week29)	Revision and discussion with students (answering questions)
Session 28 (Week 30)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

First Aid and Occupational Safety

1	**Course name**	First Aid and Occupational Safety
2	**Course Code**	MT108
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course covers the principles of first aid and the important equipment used to provide first aid. It also gives a general information about human body, and the symptoms and danger signs of medical problems. It also covers the laboratory safety issues and the important precautions needed to be taken before, during, and after finishing the laboratory work. Occupational health and safety (definition, aims, quality, requirements, and procedure). How to promote occupational health and safety in work place. Occupational hazards, Occupational risk for radiologist. Laboratory safety, universal precaution in laboratory, waste disposal.
Textbooks required for this Course:	• First aid prepared by Ala'a Aqil Khadder, Publisher Arab community library for publishing of Distribution, 2012. • First Aid, CPR, and AED: Standard - 7th edition by AAOS • Handbook of Occupational Safety and Health, Third Edition 2019 Editor(s):S. Z. Mansdor • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: 1- Distinguish the types of injuries and how to deal with them. 2- Describe disease or injury to person. 3- Explain the procedures, operations and treatments to save the injured person. 4- Determine through symptoms and sings the appropriate diagnosis for the condition.

	5- Understand the framework of the Health and Safety at Work etc, and the employers', employees' and visitors' duties. 6- Evaluate hazards and risks in order to carry out a risk assessment. 7- Understand the legal requirements to report any accident or dangerous occurrence. 8- Develop risk assessments for scientific laboratories that use chemicals or biological organisms or both. 9- State the various controls that protect laboratory personnel, including engineering, administrative, work practices, and personal protective equipment.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to emergency care (definition of first aid, equipment and supplies, and procedures of first aid).
Session 2 (Week 2)	Patient assessment (primary survey, secondary survey for patient trauma, and baseline vital sings).
Session 3 (Week 3&4)	The air way (oxygen sources, equipment for oxygen delivery, masks, air way accessories, and suction). Recovery position (definition, purpose, principles, and methods).
Session 4 (Week 5)	Care of respiratory system and Care of heart function
Session 5 (Week 6&7)	Disorders of cardiovascular system (shock, coma, angina, heart crisis, and stroke).
Session 6 (Week 8&9)	Disorder of respiratory system (asphyxia, choking, drowning, inhalation of fumes, and asthma).
Session 7 (Week10)	Loss of consciousness (definition, causes, signs and symptoms, and aid and treatment).
Session 8 (Week 11)	Bleeding (definition, classification, type of bleeding, emergency care or aid and treatment).
Session 9 (Week 12)	Soft tissue injuries (wounds), definition, types, and emergency care.
Session 10 (Week 13&14)	Bones injuries (introduction about bone and skeletal system, fracture definition, type, causes, clinical sings, aid and treatment). Joint and muscle injuries (dislocation of joint, sprain of joint, and spasm).
Session 11 (Week 15)	**Med term Exam**
Session12(Week16&17)	Burns (introduction about skin, definition, source of burns, classification, and general complication of burns, aid of burns, and aid of simple and major burns).
Session 13 (Week18&19&20)	Poison and toxicity (introduction, animal toxin, plant and metal poison, and medical substance poison). Environmental emergency (heat stroke, heat exhaustion, heat cramps hypothermia, and frost bite) and Home nursing.
Session14(Week21& 22&23)	Occupational health and safety (definition, aim, quality, requirements, procedure and how to promote occupational health and safety in work place).

	Occupational hazards (physical, biological, chemical, psychosocial). Universal symbol used in occupational health and safety.
Session 15 (Week 24&25)	Occupational risk for radiologist. Radiology safety equipment and essential safety equipment for all types of radiology departments.
Session 16 (Week26&27)	Laboratory safety (introduction, general laboratory safety rules, and basic laboratory safety rules).
Session17(Week28&29)	Wastes, waste types, and universal wastes. Disposal, handling, and storing of wastes Waste labeling, recycling and disposal guidelines,
Session 18 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Instrumentation

1	**Course name**	**Instrumentation**
2	**Course Code**	MT109
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Program hired Instructor
8	**Instruction Language**	English language
9	**Date of course approval**	2022

Brief Description:	The course is designed to enable the student to understand the components and basic electrical circuits behind the construction of medical instruments
Textbooks required for this Course:	* Biomedical engineering Handbook: second editions ED. Joseph D. Bronzino Boca Ration: CRC Press LLC: 2000. *J. W. Nilsson and S. Riedel, Electric Circuits, 11th Edition, 2018, Pearson, ISBN13: 978-0134746968. * Stuart Porter, Fourteenth Edition 2011, Churchill Living stone , Tidy's physiotherapy * Physics and Instrumentation of Diagnostic Medical Ultrasound, Peter Fish * Essential Physics for Radiographers, John Ball, Adrian D. Moore, Third Edition * Introduction To Biomedical Equipment Technology, Fourth Edition; Joseph J. Carr, John M. Brown. 2001 by Prentice-Hall, Inc. * Principles of Biomedical Instrumentation and Measurement. R. Aston; Merrill. * Applied Clinical Engineering. B. Feinberg; Prentice-Hall, Inc. * Introduction to Biomedical Electronics. J. Dubovy; McGraw-Hill. *Principles of Applied Biomedical Instrumentation. L. Geddes and L. Baker; John Wiley. *Textbook of Medical Physiology. A. Guyton; Saunders. *Essentials of Physiology. J. Lamb et al; Blackwell. *Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor. http://www.bmes.org/ http://arjournals.annualreviews.org/loi/bioeng?cookieSet=1 http://www.aami.org/publications/BIT/index.html

	http://www.biophysj.org/ http://emb-magazine.bme.uconn.edu/ http://emb-magazine.bme.uconn.edu/ http://www.iee.org/Publish/Journals/ProfJourn/MBEC/ http://spie.org/app/Publications/index.cfm?fuseaction=journals&type=jbo http://www.biomedical-engineering-online.com/start.asp
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials Class discussion, Practical Demonstrations
Course Objectives:	By the end of the course the student will be able to: • Acquaint basic design concepts essential to the understanding of biomedical engineering. • Describe the types of research studies and biostatistical parameters used in investigating medical instruments and therapy. • Describe the generalized static and dynamic characteristics of instrument performance. • Understand the different problem types and problem solving approaches in engineering, biology, and medicine. • Appreciate the applications and limitations of instrumentation in clinical environments • Uses and maintanances od medical devices
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to medical instrumentation Basic Concepts of Medical Instrumentation
Session 2 (Week 2 - 4)	Fundamental electric circuit quantities Basic amplifier Requirements Amplifiers and Signal Processing Basic Sensors and Principles Biopotential Electrodes Biopotential Amplifiers
Session 3 (Week5)	alphabet" of circuit schematics
Session 4 (Week 6)	Series and parallel resistor combinations
Session 5 (Week 7)	Issues in Contemporary Electronics Electrical Safety
Session 6 (Week 8)	Classification of Bio Medical Instruments
Session 7 (Week 9 -10)	Biomedical Measurements
Session 8 (Week 11)	Sources of Biomedical Signals
Session 9 (Week 12)	Common Medical Measurements and Instruments
Session 10 (Week 13)	Introduction to Biomedical Sensors
Session 11 (Week 14)	**Midterm Exam**

Session 12(Week15 -16)	Physiological Measurement Devices (in vivo diagnosis) Blood Pressure and Sound blood pressure monitors and Thermometers
Session 13(Week 17)	Respiratory physiology device ✓ Pulse Oximetry Spirometers
Session 14(Week 18)	Cardiac and Other Diagnostic Equipment's like (EEG,EMG Etc) Patient Monitoring devices O.T Equipment's
Session 15 (Week 19)	Dialysis equipment's
Session 16 (Week 20-21)	Basic of Laboratory medical device ✓ Microscopy ✓ centrifugation spectrophotometers, water baths, incubators, ovens, scales and CBC system .....etc
Session 17(Week 22-23)	Basic of Anesthesia and critical care related instrumentations
Session18(Week 24-25)	Basic of Dental technology equipment's
Session 19(Week 26-27)	Basic of Rehabilitation and Physiotherapy instrumentations
Session 20(Week 28-29)	Basic of Radiological and imaging instruments • Diagnostic equipment's • Therapeutic Equipment's
Session 20(Week 30-31)	Disposal of medical Equipment's Provision of Maintenance Types of medical equipment's Maintenance
Session 21 (Week 32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ثانيا: المقررات الدراسية لقسم المختبرات الطبية

ا. المقررات الدراسية للسنة الثانية قسم المختبرات الطبية

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4* 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain.

	• Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder) • Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color • Receptors and glands

	• Skin burns and disorders • Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medica Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Know the nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis.

	• Categories the metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science. • Use the commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Microbiology

1	**Course name**	General Microbiology
2	**Course Code**	MT203
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables students to know: * The microorganism and definition of all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells. *Methods and types sterilization and disinfectant. * Culturing and cultivation of Microorganisms and basic way of their identifications
Textbooks required for this Course:	• Text book of microbiology First Published in 2010 by Prem C. Bakliwal forAavishkar Publishers ISBN 978-81-7910-306-7. • https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf • https://open.umn.edu/opentextbooks/textbooks/873 • https://www.britannica.com/science/microbiology • https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/1%3A_Introduction_to_Microbiology • https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells. • Comprehend the fundamentals of molecular microbiology. • Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.

	• Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health. • Understand Microbial Cell Structure, Function and methabolism.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction, of microbiology
Session 2 (Week 2)	History of Microbiology
Session 2 (Week 3)	• Defining Microbes and Basic concepts and scope of microbiology
Session 3 (Week 4)	Pasteur and spontaneous Generation
Session 4 (Week 5 & 6)	Types of microorganisms
Session 5(Week 7,8)	Classification of microorganisms
Session6(Week 9)	Immunization, antiseptics and antibiotics
Session 7(Week 10)	Microscopy
Session 8(Week 11)	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
Session9(Week 12)	Bacterial structure& composition
Session10(Week 13)	Bacterial Genetics
Session11(Week 14 & 15)	4. Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
Session12(Week 16)	**Midterm exam**
Session13(Week 17)	Isolation and culturing of Bacteria
Session14(Week 18 & 19)	Microbial metabolism
Session15(Week 20)	Classification of bactria
Session16(Week 21)	Dyes and staining (gram stain, acid fast staining, and other staining metods).
Session17(Week22 & 23)	Fungi: 1. what is mycology? 2. Classification and structure 3. Moulds, yeasts and dimorphic fungus. Fungal diseases Algae: 4. Characteristics, structure and division of algae
Session18(Week 24 & 25,26)	Viruses 1. Definition, Characteristics, symmetry and structure of viruses, 2. Classification and growth of Viruses. 3. Detection, multiplication of Viruses. 4. Laboratory methods used for viral detection
Session19(Week 27,28)	Parasites 1. Definition, Characteristics and structure of parasites, 2. Summary of Parasitic Classification (Protozoa and Helminths). 3. Detection, multiplication of Protozoa and Helminths. 4. Laboratory methods used for viral detection
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed.

	Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Histology

1	**Course name**	Histology
2	**Course Code**	MT204
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Histology and know the different types of tissues of the body Recognize the function performed by each tissue Learn about common terms and definitions used in histology
Textbooks required for this Course:	• DiFiore's atlasof histologywith functionalcorrelations. Junqueira'sBasic Histology. • Histology: An Essential Textbook by D. J. Lowrie Jr 2020 • Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021 • Textbook of Histology by Leslie P. Gartner PhD 2021 • Histology: A Text and Atlas 7th edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015 • Wheater's Functional Histology: A Text and Colour Atlas 3rd edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities.

	active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire a basic background in histology and comparative histology in different and to understand the properties of cells and their interactions with one another as components of tissues and organs. • Understand how structure and function correlate at the microscopic level and be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination. • Understandthe changes that occur to tissues • Identify the different types of tissues • Recognize the types of tissues and the mechanisms of identifying them • understand the various diagnostic tools and medical equipment in the correct way to discover histological changes • Understand how to distinguish tissue and how it develops • deduce the causes of the changes that have occurred within the tissues
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to histology •histology and its mode of study
Session 2 (Week 2)	• The cell
Session 3 (Week 3)	• Epithelial Tissue
Session 4 (Week 4)	• Connective tissue
Session 5 (Week 5)	• Cartilage
Session 6 (Week 6)	• Bone
Session 7 (Week 7)	• Bone.
Session 8 (Week 8)	Muscle Tissue
Session 9 (Week 9)	Nerve Tissue
Session 10 (Week 10)	•Nervous System
Session 11 (Week 11)	The Immune System &
Session 12(Week 12)	Lymphoid Organs
Session 13(Week 13	Blood and Hemopoiesis
Session 14 (Week 14)	Endocrine System
Session 15(Week 15)	Hormones
Session 16(Week 16)	The integumentary system
Session 17 (Week 17)	The Circulatory system
Session 18 (Week 18)	The Circulatory system
Session 19 (Week 19)	The Circulatory system
Session 20 (Week 20)	• Respiratory system
Session 21 (Week 21)	Respiratory system
Session 22 (Week 22)	Respiratory system
Session 23 (Week 23)	Digestive system
Session 24 (Week 24)	The urinary system

Session 25 (Week 25)	The urinary system
Session26(Week26- 27)	Reproductive system
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and

	relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪ ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle

	• Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex

Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney •Urine formation •Micturition •Renal failure •Male reproductive •Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland Parathyriod Adernal gland Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.

	• Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be familiar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell

Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.

	• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**

Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratoried Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	By the end of this course student will be able to: • convey to students, the pivotal role ethics holds in medical practice. • introduces the key underlying ethical principles required in medicine. • Use the application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner • Understand the ethics of medical research • create an awareness on medical Ethics and Human Values. • instill Moral and Social Values and Loyalty • appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.

Content Breakdown	Topics Coverage
Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 1. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others; • Learn to select, use, and critically analyze current HCMN research and literature;

	• Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources

Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب - المقررات الدراسية للسنة الثالثة قسم المختبرات الطبية

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications.

	• http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem

	• Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling

	• Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Analytical Chemistry

1	**Course name**	**Analytical Chemistry**
2	**Course Code**	MT302
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Get an introduction to analytical chemistry and its applications in clinical settings. Students will learn basic principles of analytical chemistry and will explore a wide range of common techniques and methods used in modern analytical laboratories, including HPLC, mass spectrometry, spectroscopic and immunochemical techniques. Other topics include interpretation of analytical data and evaluation of error and uncertainty in measurements. The final part of this course focuses on applications of analytical chemistry in clinical and laboratory settings.
Textbooks required for this Course:	• Modern Analytical Chemistry by David Harvey 2009 • Textbook of Analytical Chemistry by Harsh Malhotra 2011 ISBN-13978-8184113143 • Analytical Chemistry, 7th Edition by Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug ISBN: 978-1-118-80516-9, 2013 • Christian, Gary D., Analytical Chemistry, 5th ed., John Wiley & Sons, New York,1994. • Day, R. A. and Arthur L. Underwood, Quantitative Analysis, 6th ed., Prentice Hall,Upper Saddle River, NJ, 1991. • Ewing, Galen Wood, Ed., Analytical Instrumentation Handbook, 2nd ed, Marcel Dekker, New York, 1997. • Gill, Robin, Ed., Modern Analytical Geochemistry: An Introduction to Quantitative Chemical Analysis Techniques for Earth, Environmental and Materials Scientists, • Addison Wesley, Harlow, U.K., 1997. • Harris, Daniel C., Quantitative Chemical Analysis, 5th ed., W. H. Freeman & Co,.New York, 1998. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor أساسيات الكيمياء التحليلية د. عاطف نصار
Course Duration	One academic year
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to:

	• Understand basic principles of analytical chemistry and various analytical techniques • Explore a range of instrumental methods of analysis, including mass spectrometry, as well as spectroscopic, chromatographic, and immunochemical methods • Be able to interpret analytical data and evaluate error and uncertainty in measurements • Understand the analyst's role and analytical chemistry applications in the clinical setting
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	• Introduction to analytical chemistry
Session 2 (Week 3&4)	• Basic tools of analytical chemistry
Session 3 (Week 5)	• Concentration expression
Session 4 (Week 6&7)	Weight percentage and volume percentage
Session 5 (Week 8&9)	• Molality and mole fraction
Session 6 (Week 10)	• Molarity and Normality concentration
Session 7 (Week 11&12)	• Methods of expression substance quantity
Session 8 (Week 13)	**Midterm Exam**
Session 9 (Week 14)	• Equivalent weight of compounds
Session 10 (Week 15)	• Stoichiometric calculations
Session 11 (Week 16)	• Parts per thousand (ppt)
Session 12 (Week 17)	• Parts per million (ppm)
Session 13 (Week 18)	• Parts per billion (ppb)
Session 14 (Week 19&20)	• Dilution calculation of solution
Session 15 (Week 21&22)	• Measure of acidity (pH)
Session 16(Week 23&24)	• Collecting and Preparing Samples
Session 17(Week 25)	• Gravimetric Methods
Session 18(Week 26)	• Titrimetric methods
Session 19(Week 27&28)	• Equilibrium chemistry
Session 20 (week 29)	Revision and discussion
Session 20 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Clinical Chemistry I

1	**Course name**	**Clinical Chemistry I**
2	**Course Code**	ML301
3	**Course type:**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	chemistry/ Biochemistry/ physiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course discusses the role of clinical chemistry in the diagnosis of diseases and explains terms and units and safety in clinical chemistry. The course also describes the preparation of reagents and storage, collection of specimens, urine analysis. The course also describes the plasma protein, lipoproteins and carbohydrate disorders, help in understanding quality control (precision & accuracy study).
Textbooks required for this Course:	• Clinical Chemistry: Principles, Procedures, Correlations (Bishop). • Practical Clinical Biochemistry (Varley). • Teitz textbook of clinical chemistry, handouts and sheets, also some web links may be used in this course provided after any lecture by instructor. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	PowerPoint Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Discuss the role of clinical chemistry in medical laboratory. • Define the following terms: old &SIU units, laboratory safety, percentage solutions, morality, normality and buffers. • Identify and describe different types of specimens used in clinical chemistry. • Recognize to the formation and composition of urine and discuss the importance of urine analysis. • Describe the operation and component part of the following instrument colorimeter, spectrophotometers and centrifuge. • Recognize different means by which glucose maybe metabolized. • Write Briefly the general function of plasma proteins and lipoproteins with explanation of their metabolism abnormality.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	• Introduction to clinical chemistry

	Definition and terminology – role in medicine
Session 2 (Week 3&4)	• Lab safely in clinical chemistry • precaution and biohazards • chemical & physical hazards • PPE Assignment 2 handed out
Session 3 (Week 5&6)	• Units of measurements conventional of SIU • Methods of concentrations expressions (Molarity, normality , percentage , molality)
Session 4 (Week 7&8)	• Collections transport and storage of specimens (phlebotomy). • Anticoagulants used in clinical chemistry types, functions, mode of action & uses.
Session 5(Week 9&10)	• Colorimeter and spectrophotometer (1) (operations , Definitions , principles , component part) • Colorimeter and spectrophotometer (2) (operations , Definitions , principles , component part)
Session 6 (Week 11& 12)	• Renal physiology , Anatomy (urine formation) • Urine analysis (1) physical examination (Macroscopic examination)
Session 7 (Week13&14)	• Urine analysis (2) chemical examination . • Urine analysis (3) deposit and Microscopically (type of cell, casts ,crystals.
Session 8 (Week 15)	**Midterm Exam**
Session 9(Week16&17)	• Carbohydrates(1) (general description ,classification metabolism and regulation
Session 10(Week18&19&20)	• Carbohydrates (2) Disorder, Hyperglycemia of D.M Hypoglycemic.
Session 11(Week20&21&22)	• Glucose Metabolic Alteration Role of lab diagnosis and PT magt. • Plasma protein metabolism synthesis and function • Plasma protein disorders methods of separation
Session 12(Week23&24	• Quality control (Definitions terms , type)
Session 13(Week25&26)	• Lipid and lipoproteins chemistry structures. • Lipid and lipoproteins disease correlation.
Session 14 (Week 27&28)	• Lipid & lipoprotein analysis(1) • Lipid & lipoprotein analysis(2)
Session 14 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hematology

1	**Course name**	Hematology
2	**Course Code**	ML302
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Biochemistry/ Physiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of hematology (blood, blood composition and function). Also this course includes the studies of blood typing and hemoglobin and all issues regarding the hemoglobin deficiencies. This course provided the student with knowledge about the common blood disorders that affect the human body. The course also discusses the implementation of quality control in hemaology lab.
Textbooks required for this Course:	• Essential Haematology, 6th Edition A. Victor Hoffbrand, Paul A. H. Moss ISBN: 978-1-118-29396-6 2011. • Schmaier, A.H. (2019). Introduction to Hematology. In: Lazarus, H., Schmaier, A. (eds) Concise Guide to Hematology. Springer, Cham. • https://doi.org/10.1007/978-3-319-97873-4_1 • Introduction to haematology by Chris Hatton • https://doi.org/10.1093/med/9780198746690.003.0510 • Introduction to haematology and transfusion science by David Ah-Moye; Ceinwen Davies; Joanne Goody; Peter Hayward; Rebecca Frewin • Evans TC, Jehle D (1991). "The red blood cell distribution width". *J Emerg Med*. 9 Suppl 1: 71–4. • Miale, John B. Laboratory Medicine: Hematology. 5th. St. Louis: C.V. Mosby, 1977. • https://askhematologist.com/common-hematology-tests/ • https://askhematologist.com/common-hematology-tests/#ixzz7jH0E2mPN • http://www.myvmc.com/anatomy/blood-function-and-composition • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor:- /
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, (Presentations) Group interaction and discussion (tutorials) self-directed activities (assignments) active participation (seminars)

	Laboratory experiments (lab lectures)
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand composition, nature and function of blood. • Identify blood forming organs, blood vessels ,hematopoiesis process, blood cells and hemoglobin • Recognize the general concept of blood (its formation, its composition, its properties, its function and its vital role in the human body. • Identify representations, terms, conditions, and some disorders that could affect the blood cells and disturb the hemostasis of the body. • Recognize different aspects of the hematology, blood cells and blood disorders. • Construct a strong foundation and idea regarding the course outlines and contents • Write a good conclusion about the hematology that reflects the extent of comprehension and understanding the course. • Develop a high quality skills in the filled of hematology • Implement the learned stuff practically to reflect the course understanding.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to hematology • brief History • Overview and aspects of hematology
Session 2 (Week 2&3)	• Introduction to Blood • Compositions of Blood • Properties of blood • Function of Blood Assignment 2 handed out
Session 3 (Week 3&4&5)	• Circulation system • Blood vessels (arteries, veins and capillaries) • Stem cells (Source of blood)
Session 4 (Week 6&7)	• hematopoiesis • Types of hematopoiesis • Regulation of hematopoiesis • Process of hematopoiesis
Session 5 (Week 8&9)	• Erythropoiesis • RBCs formation •Maturation and regulation of Erythrocytes
Session 6 (Week 10&11&12)	• Characteristics of RBCs • Compositions of RBCs •Life Cycle of RBCs •Bilirubin metabolism •Eryptosis
Session 7 (Week 13&14)	• Myelopoiesis • Monopoiesis • Characteristics of Leucocytes •Function of Leucocytes

	• Regulation of WBCs
Session 8 (Week 15)	**Midterm Exam**
Session 9 (Week 16&17)	• Thrombopoiesis •Platelets formation • Regulation of Thrombopoiesis
Session 10 (Week 18&19)	• Characteristics of Platelets •Platelets Function and Structure •hemorrhage and platelets role in stop bleeding •Fibrinolysis
Session 11 (Week 20&21)	•Clotting factors •Types and function of clotting factors •Clotting factors and clot formation •Sources, activation and mechanism of action of clotting factors
Session 12 (Week 22&23)	•Hemoglobin •Composition of hemoglobin •Biosynthesis of Hemoglobin •Metabolism of hemoglobin
Session 13 (Week 24 &25)	•Types of hemoglobin •Inheritance of hemoglobin •Destruction process of hemoglobin
Session 14 (Week 26)	•Blood typing •Blood group systems •Antigens and antibodies of blood groups
Session 15 (Week 27&28&29)	•Overview of blood disorders •Types of blood disorders •Signs, diagnosis and treatments of blood disorders
Session 16 (Week 16)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Bacteriology

1	**Course name**	**Medical Bacteriology**
2	**Course Code**	ML303
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General microbiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course provided the student with knowledge and basic principles of medical bacteriology. and enable them to understand the characteristics and classification of microorganisms and bacteria from a medical perspective, emphasizing mechanisms by which they replicate and reproduce, their means of growth and growth requirements, and the general properties of bacterial cultures and their properties. The main topics covered in this course are: Development of diagnostic bacteriology; The host's encounter with microbes; Safety and specimen collection; Cultivation of microorganisms; Presumptive identification and final identification; Aerobic gram-positive cocci; Aerobic gram-negative cocci; Aerobic gram-positive rods; Enterobacteriaceae; Anaerobic bacteria; Mycobacterium species; Opportunistic and nosocomial infections.
Textbooks required for this Course:	1. Bailey & Scott's diagnostic microbiology. 2. Diagnostic Microbiology and Infectious Disease 3. https://www.textbookofbacteriology.net/ 4. Medical Bacteriology: A Practical Approach (Practical Approach Series, 265) 2nd Edition by Peter Hawkey , Deirdre Lewis 2nd edition 2004 5. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_occupational_health_students/medicalbacteriology.pdf 6. Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	PowerPoint Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the laboratory diagnosis of bacterial infection. • Isolate and identify of pathogenic bacteria. • Do different staining and know the advantages and disadvantages of various stains used in bacteriology lab. • Know different types of culture media and biochemical tests and what they are used for.

	• Recognize pathogenic bacteria; detection of bacterial antigens and detection of nucleic acid sequences by e.g. PCR technique. • Determine the antimicrobials to be used in the sensitivity testing of different types of pathogens. • Understand the general characteristics, clinical disease, epidemiology, laboratory diagnosis and the treatment for every pathogenic bacterium.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	Introduction to Diagnostic Medical bacteriology Koch's Postulates Definitions of medical bacteriology Factors controlling growth of organisms Endotoxins Exotoxins 1. Intracellular Targets 2.Cellular Targets
Session 2 (Week 3)	Examples of Two-Component (A-B) Exotoxins with Intracellular Targets. Comparison of bacterial exotoxins with endotoxins Host parasite interaction Pathogen virulence
Session 3 (Week 4 -5)	The Gram Negative Bacilli Family Enterobacteriaceae Antigenic properties of enterobacteriacae
Session 4 (Week 6 - 7)	Classification of enterobacteriacae according to their ability to ferment lactose... Lactose fermenters (LF) Non-lactose fermenter (NLF) Delayed lactose fermenter (DLF) Principle of Triple Sugar Iron Agar (TSIA)
Session 5 (Week 8 - 9)	Escherichiae: Diagnosis of Escherichiae Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. TREATMENT: Antibiotic sensitivity testing must be performed
Session 6 (Week 10 -11)	**Enterobacter** spp General properties Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed
Session 7 (Week 12 - 13)	Citrobacter spp Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed
Session 8 (Week 14)	**Midterm Exam**
Session 9 (Week 15)	Klebsiella spp

	Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed
Session 10 (Week 16 -17)	**Serratia**spp Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. TREATMENT: Antibiotic sensitivity testing must be performed **Proteus group** Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. TREATMENT: Antibiotic sensitivity testing must be performed
Session 11 (Week 18 -19)	**Salmonella** **Shigellae** Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed.
Session 12(Week 20 -21)	**Yersinia** **Pseudomonas** **Vibrio** **Campylobacter and helicobacter** Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed
Session 13(Week 22 -24)	Gram positive cocci **Staphylococcus** General Characteristics *S. Aureus, S. epidermidis* and S. *saprophyticus* Morphology (Gram stain) and Cultural characters Biochemical Characteristics and Serology tests Sensitivity testing and treatment **Streptococci** Pathogenic species: 1. *Streptococcus pyogenes 2. Streptococcus agalactia* *3. Streptococcus faecalis 4. Streptococcus pneumonia* 5. The viridans group (*Streptococcus viridans)* Morphology (Gram stain), Cultural characters and Biochemical Characteristics Serology tests, Antibiotic sensitivity testing and treatment **The gram negative cocci** Neisseria gonorrhea and Neisseria meningitidis
Session 14 (Week 25 -26)	**Gram Positive Bacilli** AEROBES Corynebacterium, Listeria, Bacillus, Gardnerella and Nocardia ANAEROBES Clostridia, Actinomyces Morphology (Gram stain) , Cultural characters, Biochemical Characteristics, Serology tests and Antibiotic sensitivity testing and treatment

Session 15 (Week 27 -28)	**Acid fast bacteria** Mycobaterium tuberculosis and TB Mycobacterium bovis Mycobacterium leprae, and lyprosy
Session 16 (Week 29)	Opportunistic and nosocomial infections.
Session 17 (Week 30)	Revision and discussion
Session 18 (Week 31 -32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Parasitology

1	**Course name**	Medical Parasitology
2	**Course Code**	ML304
3	**Course type:**	**Specialty**
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General Microbiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course is intended to introduce fundamental and important aspects of the morphology and life cycles of protozoa and helminths causing human disease, in addition to pathological processes caused by these parasites. Special attention is given to life cycle and methods used in collection and examination of specimens used for the diagnosis of parasitic diseases. and to to equip medical technology (mainaly laboratories department) students with the basic concepts of medical Parasitology and general laboratory diagnosis of parasitic diseases of human importance; to provide the students with basic knowledge and understanding of the medically important protozoa and their detection and identification in different clinical specimens.

Textbooks required for this Course:	1. Heelan J.S, Ingersoll F.W. Essential of Human Parasitology. Delmar 2002. 2. Cheesbrough M. District Laboratory Practice in Tropical Countries. Part 1, Cambridge 2013. 3. Debub University. Parasitology for Health Science Students, lecture note series; 2004. 4. Beaver P.C, et al. Clinical Parasitology. K.M Varghese Company; 12th edition, 2010. 5. Markell et al. Medical Parasitology. W.B Saunders Company 6th edition 1986. 6. Brown H. Basic Clinical Parasitology. ACC Norwalk; 5th edition, 1983. 7. Chiodini P.L. et al. Atlas of Medical Helminthology and Protozoology. Churchill Livingstone, 6th edition; 2008. 8. Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, active participation, Laboratory experiments, hospital training.
Course Objectives:	By the end of this course the students should be knowledgeable of: • Basic morphology and life cycles of parasites causing human disease. • Specimens to be collected and the methods used for their examination in the diagnosis of parasitic diseases. 3. An understanding of the clinical diseases caused by these parasites • Understand the classification, clinical features, pathogenesis, laboratory diagnosis and prevention and control measures of protozoa. • Basic practical skills of laboratory techniques (specimen collection, processing, examination and reporting) and apply quality assurance in medical parasitology laboratory. • Discuss the concepts of parasitism, the relationships between parasites and host, between parasites and environment and the cultural and socioeconomic factors affecting the transmission of parasites. • Explain the general epidemiological aspects of parasites that affect human • Illustrate the life cycle of specific parasites. • Explain laboratory quality control in parasitology. • List characteristics used to identify protozoa parasites involved in human infections. • Classify parasites having medical significance for human classification of protozoa. • List the most common medically important protozoa. • Describe the prevention and control measures of protozoa. • Compare and contrast the different techniques of protozoa. • Explain laboratory quality control in parasitology.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Covered**

Session 1 (Week 1)	1. Introduction to Medical Parasitology 1.1 Definition of terms 1.2 Features of parasites 1.3 Source of infection 1.4 Mode of transmission 1.4.1 Direct mode of transmission 1.4.2 Indirect mode of transmission 1.5 Routes of transmission 1.6 Host parasite inter-relationship 1.7 Effect of parasites on the host
Session 2 (Week 2)	1.8 Host susceptibility factors. 1.9 Escape mechanisms of parasites from the immune system 1.10 General life cycle of parasites 1.10.1 Direct life cycle 1.10.2 Indirect life cycle
Session 3 (Week 3)	2. Taxonomy of protozoa 2.1 Quality control of stool examination 3. Different types of amoebae
Session 4 (week4)	**3.1. *Entamoeba histolytica*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.2. *Entamoeba Hertmanni*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.3. *Entamoeba coli*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control Assignment 1 handed out **3.4 *Entamoeba gingivalis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.5 *Iodamoeba butschili*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.6 *Entamoeba polecki*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 5 (Week 5)	4. General laboratory diagnosis of parasites 4.1 Types of specimens (urine, blood, stool, sputum, skin.) Assessment • Quiz 1
Session 6 (week 6)	4.2 Collection and preparation of specimen used for parasitological examination 4.3 Preservation of parasites Tutorial for an hour
Session 7 (week7)	4. The Oro-intestinal and Urogenital Flagellates 4.1 General Characteristics of Intestinal flagellates

	4.1.1 *Dientamoeba fragilis* Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 8 (week 8)	***4.1.2 Chilomastix mesnili*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***4.1.3 Giardia lamblia*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***4.1.4 Trichomonas hominis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis ***4.1.5 Trichomonas vaginalis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***4.1.6 Trichomonas tenax*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 9(week 9)	5. Introduction of blood and Tissue Flagellates 5.1 General Characteristics Assignment 2 handed out 5.1.1 Leishmaniasis **5.1.2 Leishmania tropica minor** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **5.1.3 Leishmania tropicam major** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **5.1.4 *Leishmania aethiopica*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 10(week10)	***5.1.4 Leishmania donovani*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***5.1.5 Leishmania Mexican complex*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***5.1.6 Leishmania braziliensis complex*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control

حكومة الوحدة الوطنية
وزارة التعليم العالي والبحث العلمي
الوزير

Session 11(week 11)	6. Trypanosomiasis **6.1. *Trypanosoma gambiense*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **6.2. *Trypanosoma rhodesiense*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **6.3. *Trypanosoma cruzi*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 12(week12)	**Midterm Exam**
Session 13 (week13)	**7. Plasmodium spp** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **8. Toxoplasma and Toxoplasmosis** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **9. coccidian (Sporozoa) and ciliated parasites of man** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control. Lab • Examination of persevered specimens and slides and identification of different parasites.
Session 14 (week 14)	**10. Family Culicidae- Mosquitoes** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **11. Family Psychodidae – Sand fly** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **12. Family Muscidae – House fly, Family Glossinidae** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control Assessment • Quiz 2
Session 15 (week 15)	• Nematodes : Enterobius, Ascaris, Trichuris, Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 16 (week 16)	Trichinella, Strongyloides, Hookworms Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control

Session 17 (week 17)	Blood and tissue nematodes : Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 18 (week 18)	Microfilaria, Tapeworms : T. solium, T. saginatum. D. latum Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 19 (week 19)	Tapeworm : E. granulosus Cysticercosis Hymenolepis nana Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session20 (week20&21)	Trematodes : Schistosoma, Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session21(week22&23)	Trematodes : Gastrointestinal and pulmonary flukes Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 22 (week 24)	Assessment • Presentation I Tutorial for an hour
Session 23 (week 25)	Direct Wet mount (Saline, blood, Iodine) &Examination and identification of intestinal parasites.
Session 24 (week 26)	General introduction of Laboratory techniques Collection &Preservation of samples.
Session 25 (week 27)	Stool examination, Concentration Techniques, Sedimentation, Flotation
Session 26 (week 28)	Special Techniques, how to write a report,
Session 27(week 29)	Revision (questions answering and discussion).
Session 28(week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pathology

1	**Course name**	**Pathology**
2	**Course Code**	MT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences, plus investigation of those pathological mechanisms common to all tissue-cell pathology. Attention is paid to the processes of cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Robbins & Cotran Pathologic Basis of Disease (Robbins Pathology) 10th Edition by Vinay Kumar MBBS MD FRCPath Abul K. Abbas MBBS , Jon C. Aster MD PhD 2020 • Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744. • Textbook of pathology by Harsh Mohan 6th edition, ISBN: 978-81-8448-702-2, 2010. • https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the common terms and definitions used in pathology • Identify of the nature of the disease, including its causes, growth patterns, and consequences

	• Recognizethe biological characteristics that distinguish each disease from the other. • The ability to distinguish the origin of the disease and how it develops The ability to distinguish the origin of the disease and how it develops •That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment •The student will infer the causes of disease and its growth patterns •The student determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Pathology gives explanations of a disease by studying the following four aspects of the disease 1. Aetiology 2. Pathogenesis 3. Morphologic changes 4. Functional derangements and clinical significance •The causes of disease Environmental factors Genetic Factors
Session 2 (Week 2)	**Cell injury.** - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury (Reversible & Irreversible cell injury).
Session 3 (Week 3)	**Cell injury.** - Free radicals (sources, effects & destruction of FR). - Cell injury by chemicals and Cell injury by viruses.
Session 4(Week 4)	**Cell injury.** - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
Session 5 (Week 5)	• **Inflammation .** a. Acute inflammation & its types.
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	• **Repair and healing**.
Session 8 (Week 8)	• **Infectious diseases**. a. Bacterial, Viral, Fungal and Parasitic infection - a general outline b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis & Hydatid disease.
Session 9 (Week 9)	•**Immunopathology**. 1. Immune mechanism of tissue injury: a. Type I hypersensitivity. b. Type II hypersensitivity. c. Type III hypersensitivity. d. Type IV hypersensitivity.

	e. Tissue transplantation.
Session 10 (Week 10)	2. Autoimmune diseases: a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis. c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
Session 11(Week 11)	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
Session 12(Week 12)	• **Nutrition disorder.** Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• **Ionizing radiation**. a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• **Hemodynamic disorders** Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	**GENETIC DISORDERS** a. Single - Gene Defect "Mendalian Disorders" b. Disorders with Multifactorial Inheritance
Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• **Neoplasia.** - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	**Respiratory diseases.** Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	**Cardiovascular diseases .** - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28)	**Revision and discussion**
Session 22(Week29 - 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospital Training I

1	**Course name**	**Hospital Training I**
2	**Course Code**	ML306
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Histology/Microbiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is divided into 4 main sections: Hematology, clinical chemistry, microbiology and Histo-pathology. It provides students with essential knowledge and all practical work in the medical laboratories labs.
Textbooks required for this Course:	• Hess, J. R.; Biomedical Excellence for Safer Transfusion (BEST) Collaborative (2012). "Scientific problems in the regulation of red blood cell products". Transfusion. 52 (8): 1827–35. doi:10.1111/j.1537-2995.2011.03511.x. PMID 22229278 • http://www.laboratories.org/Patients/Basics/Banking.aspx • Christopher D. Hillyer - Blood Banking and Transfusion Medicine: Basic Principles and Practice: 2nd (second) Edition Hardcover • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor:-
Course Duration	6 * 28 = 168 teaching hours
Delivery	Lecture-based, (Presentation and tutorials) Group interaction and discussion self-directed activities (Write a detailed report on the practical side) Laboratory experiments (training in the lab)
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: ▪ Figure out Safety in medical laboratory ▪ Know types and uses of different blood test tubes in medical laboratory. ▪ Collection of blood. ▪ know the components, properties and composition of blood ▪ Identify the types of blood types present and how to identify them ▪ Recognize the the causes and consequences of wrong and unsafe blood transfusions and the consequences of that. ▪ Identify the correct mechanisms for receiving patient samples and methods of dealing with them ▪ Recognize all types of analyzes for all parts of the body and how to perform them in the laboratory. ▪ Understands the accuracy of the results of blood chemistry tests and calibrates them to avoid any possible errors. ▪ Construct a strong confidence and ability to use all available equipment to perform all medical analyzes

	▪ Performing all tests of biological samples (blood, urine , tissue and feces) to detect and classify microbes that infect the body. ▪ Develop a good methods of culturing and growing bacteria ▪ Implement the learned stuff practically to reflect the course understanding.
Course Assessments	Lab Report: 30 % Homework: 10% Practical Exam: 60% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Safety in medical laboratory. Types and uses of different blood test tubes in medical laboratory.
Session 2 (Week 2)	Collection of blood. Separation of serum from blood. Separation of plasma from blood.
Session 3 (Week 3)	Hematology Department: Introduction of Hematology lab.
Session 4 (Week 4)	Types sample and tests in Hematology laboratory. Normal ranges.
Session 5 (Week 5)	Type of anticoagulants in vitro. Bleeding Time, and Prothrombin Time (PT).
Session 6 (Week 6)	Clotting Time, and Platelet count.
Session 7 (Week 7)	Bleeding Disorders and Thrombin Time.
Session 8 (Week 8)	Slide preparation and Staining.
Session 9 (Week 9)	Blood film.
Session 10 (Week 10)	Full Blood count.
Session 11 (Week 11)	Biochemistry Department: Introduction of Biochemistry laboratory. Types sample and tests in Biochemistry laboratory.
Session 12 (Week 12)	Determination of Glucose in Blood/Serum, Glucose Tolerance Tests.
Session 13 (Week 13)	Principals of colorimetry & overview of semi analyzer.
Session 14 (Week 14)	Renal Function Tests 24 hr collection, preservation Physical. characteristics, clearance tests.
Session 15 (Week 15)	Glucose Homeostasis, overview DM, HGAIC.
Session 16 (Week 16)	Serum electrolyte Potassium estimations. Estimation of serum Calcium.
Session 17 (Week 17)	Serum and urine creatinine.
Session 18 (Week 18)	Histo-pathology Department: Introduction of Histo-pathology laboratory
Session 19 (Week 19)	Types sample and tests in Histopathology laboratory Demonstration of Histo-pathology techniques Trimming
Session 20 (Week 20)	Tissue embedding Tissue processing
Session 21 (Week 21)	Microtome Staining and Mounting
Session 22 (Week 22)	Microbiology Department:
Session 23 (Week 23)	Introduction of Microbiology laboratory.
Session 24 (Week 24)	Types of sample and tests in Microbiology laboratory
Session 25 (Week 25)	Types of media in microbiology.
Session 26(Week 26)	How to prepare culture media in microbiology.
Session 26 (Week 27)	Types of bacterial culture media.
Session 27 (Week 28)	Revision (equations answering and discussion).

Session 28 (Week 29)	Handling the lab report and final assessment
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until training is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج. المقررات الدراسية للسنة الرابعة قسم المختبرات الطبية

Clinical Chemistry II

1	**Course name**	**Clinical Chemistry II**
2	**Course Code**	ML401
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Biochemistry/ physiology /Clinical Chemistry I
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course provided the student with knowledge about renal function and abnormal change of NPNs, electrolytes with emphasis on their laboratory diagnosis. Also provided them with knowledge about liver function and abnormal change of bilirubin, enzyme with emphasis on their laboratory diagnosis for several liver diseases and disease manifestations. The course also discusses the implementation of quality control in clinical chemistry lab. This course includes the studies of hormone function, classification, action and hormonal assays. Also it includes the understanding of enzymes classification, function and clinical importance in diagnosis.
Textbooks required for this Course:	• Clinical Chemistry: Principles, Procedures, Correlations (Bishop) • Clinical Chemistry By David White, Nigel Lawson, Paul Masters, Daniel McLaughlin 2016, 1st edition> • Practical Clinical Biochemistry (Varley). • Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics (Fundamentals of Clinical Chemistry (Tietz)) 7th Edition by Carl A. Burtis PhD, David E. Bruns MD • Additional Resources.handouts and sheets, also some web links may be used in this course provided after any lecture by instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: •Understand the pathophysiology of kidney and renal function. •Understand the biochemistry of non-protein nitrogenous substance and clinical significance of them •Discuss the biochemical change of electrolytes with emphasis on their laboratory diagnosis. •Define the term quality assurance -. • Understand the biochemical aspects of liver disease. • Describe the laboratory methods employed for the analysis of liver function

	•Recognize enzyme classification , function , clinical importance and diagnosis •Discuss the laboratory methods employed for analysis of liver enzymes & cardiac enzyme. •Outline hormone function, clinical importance and assay. •List different method to analyze hormone and enzymes •Discuss the laboratory methods employed for analysis of electrophoresis and chromatography.
Course Assessments	Activities 10% Midterm exam % 20 Attendances 10% Final Exam %60 A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	•Renal functions and urine formation. • Renal disorders & renal failure
Session 2 (Week 3&4)	• Non protein nitrogenous (Urea method estimation Disease correlation) • NPNs Urea &ammonia significance. Assignment 2 handed out
Session 3 (Week 5&6)	• Creatine &creatinine metabolism, methods of estimation and disease correlation. • Uric acid metabolism ,disorders& methods of determination.
Session 4 (Week 7&8)	•Body fluids • Electrolytes, water , blood volume & osmolality
Session 5 (Week 9 &10)	• Na & K metabolism • Disease correlation, methods of estimation.
Session 6 (Week 11 &12)	• Flame photometer ,principle and component parts • Ion selective electrode for Na & K
Session 7 (Week 13 & 14)	• Calcium metabolism, disease correlation &methods of estimation. • Phosphorous metabolism, method of estimation & disease correlation.
Session 8 (Week 15)	**Midterm Exam**
Session9(Week 16&17)	• Acid-Base balances • Acid-Base Imbalances and compensation(respiratory).
Session10(Week18&19)	• Acid-Base Imbalances and compensation(metabolic). • Quality control & quality assurance
Session11(Week20&21)	• Liver anatomy ,physiology, function & Classification of jaundice • Liver disorders and manifestations.
Session12(Week22&23)	• Introduction to Enzymology &enzymes with medical significance. • Liver enzymes, Transferases enzymes(ALT, AST). •Liver enzymes(ALP &GGT).
Session13(Week24&25)	• Cardiac biomarkers and enzymes (Ck, AST, LDH, troponin & myoglobin). • Acute myocardial infarction diagnosis
Session 14(Week 26 &27)	• Introduction to hormone (classification and mechanism). • Hypothalamus and pituitary.
Session 15(Week 28 &29)	• Thyroid and parathyroid hormone • Gonads and fertility hormone • Adrenal hormone
Session 16 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is

	dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Blood Bank & Blood Transfusion

1	**Course name**	Blood Bank&Blood Transfusion
2	**Course Code**	ML402
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Hematology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of phenotyping and genotyping of significance blood groups, fractionation of blood products. Briefly focus on the immune reactions of blood transfusion and important factors that effect on haemagglutination.
Textbooks required for this Course:	• Blood banking and transfusion medicine(second Edition 2003), H Silberstein, N Anderson Roback. • Practical transfusion medicine (2001), M. F Murphy,..et al • Blood banking and transfusion MEDICINE, Second Edition 2007 by C. D. Hillyer, L. E. Silberstein, P. M. Ness, K. C. Anderson J • https://www.papdi.or.id/pdfs/401/BloodTransfussionGuidelines.pdf • Textbook of blood bankikg and transfusion medicine 2nd edition 2005 • Modern Blood Banking & Transfusion Practices 7th Edition 2018 by Denise M. Harmening PhD MT (ASCP).

	• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor. • https://www.dovepress.com/journal-of-blood-medicine-journal
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: differentiation between types of blood groups. • Understand molecular information and the nature of blood group antigens. • Identify the medical terms and abbreviations. • Recognize the transfusion reactions. • Identify representations, terms, conditions, and specificity of blood group antigens. • Recognize different methods to follow up factors influencing antigen antibody reactions. • Construct blood products. • Write descriptions of systems of variety of blood groups. • Develop a technique in the lab. • Implement an experiment.
Course Assessments	Activities 10% Midterm exam % 20 Attendances 10% Final Exam %60 A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to component and nature of blood transfusion.
Session 2 (Week 2)	•Types of clinical significance of blood group antigens.
Session3 (Week 3)	• Elements of specific antibodies that recognize RBCs antigens
Session 4 (Week 4)	• ABO antigens • Distribution of ABO system
Session 5(Week5)	• Genetics formations and biochemical synthesis of ABO system
Session 6 (Week 6)	• Immunoglobulins (Antibodies), identification, classifications, functions
Session 7 (Week 7)	• Antigens, immunogenicity, important characteristics which effect haemagglutinations.
Session 8(Week 8)	• Rhesus blood group system • Discovery history, Expression on the body fluids, presence on RBCs Types of D-antigens, molecular information , kinds of D-antibodies Clinical significant reactions of D antigens.
Session 9(Week 9-10)	• Rhesus blood group system • Discovery history, Expression on the body fluids, presence on RBCs Types of D-antigens, molecular information, kinds of D-antibodies Clinical significant reactions of D antigens.
Session10(Week11-12)	• Kell blood group system, immunization, genetically instruction, Abs types.
Session11(Week13)	• Diego blood group system, expression, molecular information, common phenotyping, clinical significance of Diego antibodies.
Session 12 (Week 14)	**Midterm Exam**

Session 13 (Week15-16)	• Kidd blood group system, Abs specificity, expression, transfusion reaction.
Session 14 (Week16-17)	• Duffy blood group system, genetically information, general phenotyping,
Session 15(Week17-18)	* Lewis blood group system * Lutheran blood group system
Session 16 (Week19)	• Plasma transfusion, functions, ...clinical uses. blood transfusion, donor selection criteria
Session 17 (Week20)	• Platelets transfusion, preparations, usages, storages, *The H-blood group, common H phenotype, function,H-antigen specificities, H-antibodies,...transfusion reactions.
Session 18(Week21-22)	•MNSs blood group system •P blood group system
Session 19(Week22-23)	*Transfusion reactions, hemolytic transfusion, types (acute or chronic), factors that determine the severity of the disease. *Intravascular Haemolysis and Extravascular Haemolysis.
Session 20 (Week 24-25)	*Febrile non-hemolytic transfusion reaction, White blood cell incompatibility. *Post transfusion purpura (PTP), platelets incompatibility, treatment
Session 21 (Week 26-27)	*Allergic reactions, IgE anti-allergen antibodies *Anaphylaxis *IgA anti-plasma protein antibodies reaction
Session 22 (Week 28)	*Transfusions associated Lung injury (TRALI), donor anti-leukocyte Abs attack. *Transfusion reaction: Non-immune, hypothermia .., hyperkalemia
Session 23 (Week 29)	Revision and discussion
Session 24 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Virology

1	**Course name**	Medical Virology
2	**Course Code**	ML403
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General microbiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	A study of the important principles underlying the field of virology including viral architecture, nomenclature, and genetics; mechanisms of entry and spread within the body (the mechanisms involved in viral replication and pathogenesis) Structure, classification, replication, and mechanisms of pathogenesis of human and animal viruses.; host resistance and viral evasion of the immune response; and the epidemiology of medically important viruses in the world today, their diagnosis ,treatment and vaccination.
Textbooks required for this Course:	• The recommended textbook is Principles of Virology. Vol I: Molecular Biology, Vol. II: Pathogenesis and Control (S.J. Flint et al., Fifth Edition, ASM Press 2020). ISBN: 978-1-683-67284-5 • Textbook of Medical Virology 2nd Edition by Baijayantimala Mishra 2002. • Medical Virology 4th Editionby D. E. White, Frank J. Fenner 1994. • Review of Medical Microbiology and Immunology, Warren Levinson, Lange, the McGraw- Hill Companies. • Microbiology-Lippincott's Illustrated Reviews, William A. Strohl, Lippincott's William & Wilkins. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based Power Point Presentation, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: Understand Definition of viruses, their characteristics, classification, methods of reproduction, and their spread Identify the methods of diagnosing viral diseases - it includes the study of the most important modern techniques as well as the traditional ones that are used in diagnosis. Study the genetic characteristics of the virus and its relationship to the manufacture of vaccines and antivirals

	Recognize the various diseases caused by viruses: their description, methods of transmission, diagnosis, and methods of combating them.
Course Assessments	Activities 10% Midterm exam % 20 Attendances 10% Final Exam %60 A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	• Introduction of virology: Structure, Evolution, Host range, Types. • Virus classification, Virus replication, Bacteriophages, Cultivation of viruses, Quantification of viruses
Session 2 (Week 3&4)	• Viral genetics and gene therapy • Gene therapy and recombinant vaccines • Laboratory diagnosis • Pathogenesis of viruses and Host defenses
Session 3 (Week 5&6)	• Antiviral therapy and Viral vaccines
Session 4 (Week 7&8)	• DNA Enveloped Viruses: Herpesviruses, Hepadnaviruses, Poxviruses • DNA non-envelpoed viruses : Adenoviruses, Papillomaviruses and Parvoviruses.
Session5. (Week 9&10)	• RNA Enveloped viruses: i-Orthomyxoviruses, Influenza; ii-Paramyxoviruses: Mumps, Measles, Respiratory Syncetial virus and Parainfluenza virus
Session 6. (Week 11&12)	• Coronaviruses: Corona viruses (Covid 19). • Togavirus: Rubella virus. • Rhabdoviruses: Rabies virus • Retroviruses: (i) Human t-Cell Lymphotropic Virus, (ii) Human Immunodeficiency virus (HIV).
Session 7 (Week 13&14)	• RNA non-enveloped viruses: I- Picorna viruses: A- Enteroviruses:(Poliovirus, Coxsakievirus, Echoviruses and Other Enteroviruses). B- Rhinoviruses; Common cold
Session 8. (Week15)	**Mid- Term Exam**
Session 9 (Week 16&17)	• The serological methods: - Hemagglutination and Hemagglutination- inhibition - Agar- gel precipitation test - Virus (serum) neutralization test - Immunoflurescent test-direct and indirect
Session 10 (Week 18)	• The serological methods: - Complement fixation test - Enzyme- Linked Immunsorbent Assay (ELISA) - The polymerase chain Reaction (PCR)
Session 11 (Week 19&20)	Caliciviruses, Reoviruses: Rotavisuses Hepatitis viruses , Arboviruses and Tumor viruses.
Session 13 (Week 20&21)	Hemorrhagic fever viruses: i- Yellow fever virus, ii-Dengue virus, iii- Ebola virus, iv-Marberg virus, iiv- Rift valley fever virus, iiiv- Lassa fever virus, v- Crimnal Congo Hemorrhagic fever virus Gastrointestinal tract infections- Viral Diarrheal Diseases Slow viruses infection

Session 14(Week 22&23)	• Virus isolation - In chicken embryonated eggs • Signs of virus growth in the inoculated eggs Calculation of the ID50, LD50, by Reed and Muench method
Session 15.(Week 24&25)	• Virus isolation in cell culture - Types of cell cultures - Methods of preparation of a monolayer cell culture - Method of inoculation
Session 16.(Week 26&27)	Signs of growth in cell culture, Calculation of the IC50 titer Methods of preparation of a monolayer cell culture Method of inoculation Signs of growth in cell culture, Calculation of the IC50 titer
Session 18 (Week28)	Revision, questions answering and discussion.
Session 18 (Week29)	**Practical Final-exam**
Session 19 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Molecular Diagnostics

1	**Course name**	**Molecular Diagnostics**
2	**Course Code**	**ML404**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Biology, chemistry, Biochemistry
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is intended to introduce fundamental and important topics of the Molecular Biology and the central dogma of cell life. Indeed, this course describes the Molecular diagnosis and instruments used to molecular diagnosis of human diseases.
Textbooks required for this Course:	• Basic Cell and Molecular Biology Gerald Bergtrom, University of Wisconsin, Milwaukee Copyright Year: 2018 ISBN 13: 9780996150248 • Molecular Biology Techniques A Classroom Laboratory Manual 4th Edition - 2019 Authors: Sue Carson, Heather Miller, Melissa Srougi, D. Scott Witherow ISBN: 9780128180242 • Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications Third Editionby Lela Buckingham PhD MB DLM(ASCP) 2019. • Principles and Applications of Molecular Diagnostics by Nader Rifai, A. Rita Horvath, et al. 2018. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based presentation, group interaction and discussion, and active participation.
Course Objectives:	At the end of this course the students will be able to describe the molecular cells structure, cell cycle, DNA-Damage-repair types and mechanisms of Clinical features, pathogenesis and Molecular laboratory diagnosis of genetic diseases using real time polymerase technique and other molecular diagnostic methods.
Course Assessments	Activities 10% Midterm exam % 20 Attendances 10% Final Exam %60 A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1 - 2)	Introduction to Molecular Diagnosis • Definition of molecular biology.

	• Molecular microbiology • Molecular Hematology • Molecular Parasitology • Molecular Oncology Laboratory Biosafety Guidance in Molecular laboratories • Purpose • Risk Assessment • Principal Investigator (PI) Responsibility • Laboratory Hazards.
Session 2 (Week 3- 5)	Central Dogma • Cell and cell types. • Prokaryotes and eukaryotes • Transformation principle Nucleic Acids Structure * DNA structure * RNA Structure * Protein Structure Histone proteins
Session 3 (Week 6 - 9)	Introductions to DNA Replication From DNA to Protein (Transcription) From DNA to Protein (Translation) Transformation Experiments
Session 4 (Week 10- 12)	Introduction into DNA Damage Clinical features, sources and outcomes of DNA Damage DNA Damage diseases Treatment and Prevention
Session 5 (Week 13 - 14)	DNA-Damage-Repair Types of DNA-Damage-Repair
Session 6 (Week 15)	**Midterm Exam**
Session 7 (Week 16 - 18)	Base Excision Repair Nucleotides Excision Repair Mismatch Repair
Session 8 (Week 19 - 21)	Mutations Plasmid Formation PCR Principle
Session 9 (Week 22- 24)	Convention PCR Real time PCR Protein Electrophoresis
Session 10 (Week 25-27)	DNA Sequencing Maxam/Gilbert chemical sequencing Sanger chain termination sequencing
Session 11 (Week 28)	Hybridization technologies
Session 11 (Week 29)	Revision and discussion
Session 12 (Week 30)	**Final Exam**
Attendance Expectations	You should come with appropriate course materials during the lecture and• Wear gown during the laboratory activities and never wear gown outside the•laboratory sessions (handouts,

	laboratory manuals, laboratory reports) laboratory You are expected to actively participate during discussions in the class. If you are• Complete the assignments and other activities on time. Use your time for group•working in a group or with a partner, you must be a part of the group. work and home study effectively
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Mycology

1	**Course name**	**Medical Mycology**
2	**Course Code**	ML405
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General microbiology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with comprehensive resource to learn about diagnostic and medical mycology with instruction on the structure, classification, causative agents, pathogenesis, diagnosis and treatment of fungal diseases that occur in humans.
Textbooks required for this Course:	1. Alexopulos, C. J.; Mims, C. W., & Blackwell. (1996): Introductory Mycology 4th ed. John Wily and Sons, Inc. USA, ISBN; 0-471-52229-5. 2. William, G. M. & Roderick, J. H. (2005): Medical Mycology, 10th ed. Hodder Arnold, London. http://www.hoddereducation.com . ISBN; 13-978-0-340-80912-9. 3. Kwon-Chung, K.J. & Bennett, J. E. (1992): Medical Mycology. Lea and Febiger, Philadelphia, PA, USA. ISBN; 0-8121-1463-9. 4. de-Hoog, G. S.; Cuarro, J.; Gene, J. & Figueras, M. J. (2000): Atlas of Clinical Fungi, 2nd ed. Schimmelcultures, Utrecht, The Netherlands and Universitat Rovira; Virgili, Reus, Spain. ISBN; 90-70351-43-9.

	5. Ellis, D.; Davis, S.; Alexiou, H.; Handke, R. & Bartley, R. (2007): Description of medical fungi, 2nded. Mycology unit. Women's and children's hospital. North Adelaide, Australia. ISBN; 9780959851267 (pbk.). 7. Book Title & ISBN: 1) Reiss E , Shadomi HJ, Lyon GM. 2012. Fundamental Medical Mycology. Wiley-Blackwell. ISBN: 978-0-470-17791-4 8. Additional Resources: 2) The recommended textbook is : Richardson MD, Warnock DW. 2004. Fungal infection: Diagnosis and Management. Wiley. ISBN: 9781405115780 3) handouts: Lecture handouts
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Definition of FUNGI, their characteristics, classification, methods of reproduction, and their spread. • Provide students with an overview of the major fungus diseases or mycoses that threaten animal and human health. • Study the definitions and fungal terminology. • Identify the causal agents, symptoms, modes of infections, prognosis, and treatment of fungus-related illness that will be discussed and explored in detail. • Recognize the general aspects of fungal immunology and pathology. • Identify the methods of diagnosing fungal infections - it includes the study of the most important modern techniques as well as the traditional ones that are used in diagnosis. • Recognize the various diseases caused by fungi: their description, methods of transmission, diagnosis, and methods of combating them.
Course Assessments	Activities 10% Midterm exam % 20 Attendances 10% Final Exam %60 A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Introduction to Mycology** Definition, General Characters, Nutrition, Economic Importance, Reproduction, and Classification of fungi.
Session 2 (Week2,3)	**Introduction to Medical Mycology** Definitions and Fungal Terminology Educational objectives. Human Immunity and defenses against the infestation of fungi. Diagnosis of fungal infections Clinical Observation. Laboratory investigation.

Session 3 (Week 4)	**Classification of Important Medical Fungi (fungal diseases):** 1- Superficial (cutaneous) mycoses. 2- Subcutaneous and deep (Systemic) mycoses. The major tissue reactions observed with fungal infection.
Session 4(Week 5)	**Dermatomycosis:** - Definition, - General Characters. - Clinical Types Of Dermatomycosis.
Session 5 (Week 6)	Tinea capitis: Definition, Epidemiology, and clinical manifestations of tinea capitis (Grey-patch, black dot , Kerion capitis, and Favus tinea capitis). Laboratory diagnosis.
Session 6(Week 7)	Tinea corporis: Definition, Epidemiology, and clinical manifestations and laboratory diagnosis.
Session 7 (Week 8)	Tinea cruris (Jock itch): Definition, Epidemiology, and clinical manifestations and Laboratory diagnosis.
Session 8 (Week 9)	Tinea pedis (athlete's foot): Definition, Epidemiology, and clinical manifestations (Acute or chronic interdigital, Chronic hyperkeratotic, Vesicular tinea pedis, and Ulcerative tinea pedis). Laboratory diagnosis.
Session 9 (Week 10)	Tinea unguium (Onychomycosis): Definition, Risk factor, Epidemiology, and Clinical types of Onychomycosis:(Distal subungual, Proximal subungual, White superficial, and Total dystrophic onychomycosis) and Laboratory diagnosis.
Session10(Week 11)	Tinea versicolor(Pityriasis versicolor): Definition, Epidemiology, and clinical manifestations and Laboratory diagnosis.
Session11 (Week12)	Piedra; definition and clinical classification: Clinical manifestation of white Piedra, Epidemiology and ecology, and Black piedra, clinical manifestations and Laboratory diagnosis.
Session 12(Week13)	Tinea nigra: Definition, Epidemiology, and clinical manifestations and Laboratory diagnosis.
Session13(Week 14)	*Scytalidiuum* infection; Definition, Epidemiology, and clinical manifestations and Laboratory diagnosis.
Session14(Week 15)	Keratomycosis and Otomycosis infections; Definition, Epidemiology, ,clinical manifestations and Laboratory diagnosis.
Session15(Week16)	Mid- Term Exam 20%
Session16(Week 17)	Aspergillosis; Definition, Causal organisms and their habitat, Epidemiology, and clinical manifestations Laboratory diagnosis.
Session17 (Week18)	Candidosis; Definition, Causal organisms and their habitat, Epidemiology. Clinical Manifestations of Candidosis. Laboratory diagnosis
Session18(Week 19)	Cryptococcosis; Definition, Causal organisms and their habitat, Epidemiology, clinical manifestations and laboratory diagnosis
Session19 (Week20)	Introduction in Dimorphic fungi, Systemic mycosis cause by dimorphic fungi and their criteria. Laboratory diagnosis
Session20(Week 21)	Blastomycosis and Coccidioidomycosis; Definition, Epidemiology, and clinical manifestations and laboratory diagnosis
Session21(week 22)	Histoplasmosis and Sporotrichosis; Definition, Epidemiology, and clinical manifestations. Laboratory diagnosis
Session22 (Week23)	Phaeohyphomycosis and Zygomycosis.

Session23(Week 24)	Types of fungal toxins: • * Gliotoxin., Aflatoxins, Ochratoxin, Fumonisin, T-2 Toxin, Deoxynivalenol, Patulin • * Understanding of fungal toxins and how they contribute to the modulation of host immunity.
Session24(Week 25)	Antifungal therapeutic agents. Antifungal drugs and Targets. Polyene antibiotics; Amphotericin B (Fungizone). Natamycin (Natacyn). Nystatin (Mycostatin).
Session25(Week 26)	1- Imidazole and Triazole compounds: a- Fluconazole (Difucan). b- Itraconzole (Sporanox). c- Ketoconazole (Nizoral). Other imidazole compounds for topical treatment such as Bifonazole, clotrimazole, Isoconazole-NO_3, Oxiconazole ...etc.
Session26(Week 27)	2- Allylamines: a- Terbinafine (Lamisil). b- Naftifine-HCL. Echinocandins.
Session27(Week 28)	3- Miscellaneous systemic antifungal agents: a- Flucytosine (Ancobon). b- Griseofulvin (Fulvicin). Other Miscellaneous topical antifungal agents such as Amorolfine hydrochloride, Ciclopyrox, Haloprogin ...etc.
Session28(Week 29)	Revision (questions answering and discussion).
Session29(Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospital Training II

1	**Course name**	**Hospital Training II**
2	**Course Code**	ML406
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	6 housr per week
6	**Pre-requisite requirements**	Clinical Chemistry / Immunology / Blood Bank/ Microbiology/Hematology
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is divided into 4 main sections: Blood banking, clinical chemistry, microbiology and immunology. It provides students with essential knowledge and all practical work in the medical laboratories labs. Also, provides essential knowledge about the safety guidelines followed in medical labs. It provides the student with knowledge about renal function, liver function, cardiac enzymes and electrolytes and abnormal change in these parameters with emphasis on their laboratory diagnosis. Also, provides the student with essential practical methods in field of bacterial culture and its diagnosis in vitro. It gives the students all the lab information regarding antigen – antibody reaction in the immunity field. It provided the student with knowledge about blood transfusion and its reactions in the field of Hematology and blood banking.
Textbooks required for this Course:	• Christopher D. Hillyer • Practical Clinical Biochemistry (Varley). • Hess, J. R.; Biomedical Excellence for Safer Transfusion (BEST) Collaborative (2012). "Scientific problems in the regulation of red blood cell products". Transfusion. 52 (8): 1827–35. doi:10.1111/j.1537-2995.2011.03511.x. PMID 22229278 • http://www.laboratories.org/Patients/Basics/Banking.aspx • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	6 * 28 = 168 teaching hours
Delivery	-Practical Training -Tutorials -Group interaction and discussion -Self-directed activities (Write a detailed report on the practical side) -Laboratory experiments (training in the lab)
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Familiarize the student with the components, properties and composition of blood as well as the system of different blood groups • Identify the types of blood types present and how to identify them • Recognize the causes and consequences of wrong and unsafe blood transfusions and the consequences of that.

	• Identify the correct mechanisms for receiving patient samples and methods of dealing with them • Recognize all types of analyzes for all parts of the body and how to perform them in the laboratory. •Understands the accuracy of the results of blood chemistry tests and calibrates them to avoid any possible errors. • Construct a strong confidence and ability to use all available equipment to perform all medical analyzes • Performing all tests of biological samples (blood, urine and feces) to detect and classify microbes that infect the body. • Develop a good methods of culturing and growing bacteria to help diagnose and treat the disease, as well as conducting an antibiotic sensitivity test to be able to choose the appropriate antibiotic to eliminate microbes • Implement the learned stuff practically to reflect the course understanding.
Course Assessments	Daily Assessments and homework: 20% Lab Report: 50 % Practical Exam in the lab: 30% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	• **Blood Bank Department** •Learning the safety guidelines followed in blood bank lab • ABO system of different blood groups and how to conduct tests to identify them • Identify Rh blood system
Session 2 (Week 3&4)	• The correct and safe methods for blood transfusion. • Transfusion the main blood components (serum, plasma and cells) to the patient
Session 3 (Week 5&6)	•Conduct of blood transfusion compatibility tests • Cross match •Coombs test (direct & indirect)
Session 4 (Week 7&8)	•Blood donation methods •Anticoagulants in the blood bags •Identifying the reasons that lead to blood cells clogging in the event of an incorrect blood transfusion •Saving blood and blood derivatives correctly
Session 5 (Week 9&10&11)	•**Clinical Chemistry Department** • Learning the safety guidelines followed in Clinical Chemistry lab. •Identify the correct mechanisms for receiving patient samples in the Department of Clinical Chemistry • Working all types of analyzes for all organs of the body (kidney, liver, heart, etc.)
Session 6 (Week 12&13)	• Practicing the different methods (primitive manual and modern systemic) for conducting medical tests • Ensure the accuracy of the results of blood chemistry tests
Session 7 (Week 14 &15)	• Calibrate the used machines in the lab to avoid any possible errors Apply the quality controls for all the tests to achieve reliable results •the implementation of quality control in clinical chemistry lab.
Session 8 (Week 16)	**(handing the draft of lab report)**
Session 9 (Week 17 &18)	• **Department of Immunology** •Learning the safety guidelines followed in Immunology lab.

	• Identify the correct mechanisms for receiving patient samples in the Department of immunology • Identify the immune response of the body though measuring the WBCs counts.
Session 10 (Week 19)	• Antibody-antigen reactions tests •Serology tests (ASO, RH-factor)
Session 11 (Week 20&21)	• Performing practically all the following tests ELISA, Antigen-Antibody interaction, C-reactive protein and Flow cytometry • Identify the dilution methods used in studying the proportion of the amount of foreign bodies in the body.
Session 12 (Week 22&23)	• **Microbiology department** Learning the safety guidelines followed in Microbiology lab. • Identify the different microbes that infect the body • Conducting all tests for biological samples (blood, urine and feces) to detect and classify microbes that infect the body.
Session 13 (Week 24&25)	• Preparation the media for bacterial culture dishes • Learn how to grow and grow bacteria to help diagnose and treat disease
Session 14 (Week 26&27)	• Conducting biochemical distance tests to differentiate between different types of bacteria and fungi • Conduct an antibiotic sensitivity test to be able to choose the appropriate antibiotic to eliminate microbes.
Session 15 (Week 28)	•Isolation the colonies of bacteria from different sources and growing it in different agars. •Learn about the different sterilization methods to avoid infection and the spread of microbes.
Session 16 (Week 29)	**Handling the lab report for assessment**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until training is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Immunology and Serology

1	**Course name**	**Immunology and Serology**
2	**Course Code**	**ML408**
3	**Course type: general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Microbiology/Haematology
7	**The program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The candidate will gain knowledge about immunity, organs of immunity and cells involved; Types of antigens and properties; immunoglobulin – types; MHC and its significance; hypersensitivity reactions.
Textbooks required for this Course:	• Ivan M. Roitt, J. Brostoff and D. K. Male, Immunology, Gower Medical Publishing, London.1993. • Clark WR, The experimental foundations of modern immunology. John Wiley and Sons Inc. New York. 1991. • Janis Kuby, Immunology, II edition. W. H. Freeman and Company, New York. 1993. • Janeway Travers, Immunobiology- the immune system in health and disease. Current Biology Ltd. London, New York. 3rd ed.,1997. • Peter J. Delves, Ivan M. Roitt, Encyclopedia of Immunology; Academic Press. 2 nd Ed., 1998. • Chapel H and Halbey M, Essentials of Clinical Immunology. ELBS. 1986. Medical Parasitology by K.J. Ryan • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	The course will be conducted by lectures, student group work research, discussions and presentations, individual written assignments, practical classes, and demonstrations as well as field exposure in scientific and diagnostic laboratories/ institutions.
Course Objectives:	Upon successful completion of the course, the student will be able to: 1. Understand the fundamental concepts of immunity, contributions of the organs and cells in immune responses.

	2. Acquire knowledge of the MHC molecule's function and host encounters an immune insult. 3. Understand the antibodies and complement system 4. Understand the mechanisms involved in the initiation of specific immune responses and differentiate the humoral and cell-mediated immune mechanisms 5. Comprehend the overreaction by our immune system; autoimmunity; immunologic processes governing graft rejection and therapeutic modalities for immunosuppression in transplantation
Course Assessments	Activities 10% Midterm exam % 20 Attendances 10% Final Exam %60 A 60% is required for a pass in this course.
Session 1 (Week 1)	Introduction to immunity innate and required immunity
Session 2 (Week 2)	Types of immunity: nonspecific physiological and cellular barriers.
Session 3 (Week 3)	Acquired immunity- characteristics
Session 4 (Week 4)	Antigen, Haptens and Adjuvants, Antibody
Session 5 (Week 5)	Structure and types of immunoglobulins Tutorial for an hour
Session 6 (Week 6)	Types of immunoglobulins, Assessment • Quiz 1
Session 7 (Week 7)	Distribution of immunoglobulins
Session 8 (week 8)	Function of immunoglobulins
Session 9 (Week 9)	Cells and Organs of Immune system
Session 10 (Week 10)	Organs of immune system – primary and secondary
Session 11 (Week 11)	Cells of immune system
Session 12 (Week 12)	Humoral Immune response Tutorial for an hour
Session 13 (week 13)	Midterm Exam
Session 14 (Week 14)	Cell-mediated immune response
Session 15 (Week 15)	MHC structure and function
Session 16 (Week 16)	Autoimmunity
Session 17 (Week 17)	Hypersensitivity
Session 18 (Week 18)	Lab 1. Immuno-techniques Introduction to Antigen-antibody interactions
Session 19 (Week 19)	Affinity, avidity, cross-reactivity, Precipitation reaction Tutorial for an hour
Session 20 (Week 20)	Radial immune diffusion, Ouchterlony double diffusion Assessment • Quiz 2
Session 21 (Week 21)	Agglutination reaction, agglutination titer, incomplete agglutinin
Session 22 (Week 22)	Complement fixation, ELISA
Session 23 (Week 23)	Immunocytochemistry
Session 24 (Week 24)	Clinical Immunology Transplant immunity
Session 25 (Week 25)	Immunohematology
Session 26 (Week 26)	Blood groups and blood grouping. A, B, Rh antigens and antibodies, Rh typing. Bombay group

Session 27 (week 27)	Immunization: Passive and active Vaccines-Introduction
Session 28 (Week 28)	Types and applications, DNA vaccines, Polyclonal antibodies and monoclonal antibodies. Assessment • Presentation
Session 29 (Week 29)	Revision and discussion
Session 30 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until training is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Laboratory Management and quality control

1	**Course name**	**Laboratory Management and quality control**
2	**Course Code**	**ML408**
3	**Course type**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables students to understand of the quality systems used for implementation of total quality management in the clinical laboratories. The course covers all the basic elements and tools required to implement the quality system essentials across all phases of the laboratory workflow: pre-analytical, analytical, post-analytical. In addition, it will include focused lectures related to quality and safety standards required in specialized areas such as blood bank, clinical microbiology, and molecular diagnostics. Practical examples from the laboratory setting will be part and parcel of the lecturers to help students relate theory to practice.
Textbooks required for this Course:	• Clinical Laboratory Management, Lynne S. Garcia. American Society for Microbiology • Clinical Diagnosis AND Management BY Laboratory Methods, Richard A. McPherson. Elsevier Inc. • Laboratory Quality Management System Handbook, World Health Organization 2011 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor. • https://www.sapiosciences.com/clinical-lab
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to procedure laboratory statistics • At the end of the school year, the student would be familiar with facilities and safety in laboratory •At the end of the school year, the student would be familiar with the principles of instrumentation •The student would be able to understand the statistical methods used in laboratory
Course Assessments	Activities and homework 10%

	20% Midterm exam 10% Midterm exam practical Final Exam: 40% written Final Exam: 20% practical A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to laboratories Quality Control
Session 2 (Week 2)	International laboratory standards
Session 3 (Week 3-4)	• Quality Control Assurance Definition & Introduction • Laboratory Quality Control Pre-Analytical Phase
Session 4 (Week 5 -7)	• Laboratory Quality Control Analytical Phase
Session 5(Week 8-9)	• Laboratory Quality Control Post-Analytical Phase
Session6(Week 10)	• Sources Of Laboratory Errors Pre-Analytical Phase
Session 7(Week 11)	• Sources Of Laboratory Errors Analytical Phase Post-Analytical Phase
Session 8(Week 12-13)	• Terms & Definitions In Quality Control Accuracy, Precision, Repeatability, Reproducibility, Specificity, Sensitivity.
Session9(Week 14)	• Statistical Tools In Quality Control Introduction & Definitions ▪ Normal Distribution ▪ Measures of center: ❖ Mean ❖ Median Value ❖ Mode Value
Session10(Week 15)	▪ Measure of spread of the data around the mean: ❖ Standard Deviation ❖ Coefficient of Variation ❖ Standard Deviation Index
Session11(Week16)	▪ Quality Control In Laboratory ❖ Internal Quality Control ❖ External Quality Control
Session12(Week 17)	▪ Quality Control Charts The Levey Jennings(L-J) Chart & Westgard Rules.
Session13(Week 18)	○ Water Baths, ○ Heating Blocks, Dry-Bath Incubators, And Ovens, ○ Mixing, Aqueous Solution,
Session14(Week 19-20)	• Mass spectrometry and applications
Session15(Week 21)	• Laboratory statistics ○ Preparing to analyze data
Session16(Week 22)	○ Descriptive statistics
Session17(Week23-24)	○ Comparative statistics ○ Analyzing discrete data: testing proportions

	○ Trend evaluation and correlative statistics
Session18(Week 25-26)	• Process control—sample management ○ The laboratory handbook ○ Collection and preservation
Session19(Week 27,28)	○ Sample processing ○ Sample storage, retention and disposal ○ Sample transport
Session20(Week 29)	Revision and discussion
Session21 (Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ثالثا: المقررات الدراسية لقسم الاشعة الطبية

ا. المقررات الدراسية السنة الثانية قسم الاشعة الطبية

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain.

	• Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder) • Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color • Receptors and glands • Skin burns and disorders

	• Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to

	ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis. • Know the metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated.

	• Use the tools used in biochemistry, and their potential applications to medical technology science. • Utilize the commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.

	• State the functions of each organ system of the body, explain the mechanisms by which each functions, and relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) •Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year• •Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea • Guide students on assessment methods, rules and regulations •Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System •Types Autonomic Nervous System • Chemical neurotransmitters •Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron

	•Resting membrane potential
Session 6(Week 6)	Nerve & Muscle • Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach

	•Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex
Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney •Urine formation •Micturition •Renal failure •Male reproductive •Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland Parathyriod Adernal gland Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised..

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.

	• Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be famillar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell

Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.

	• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**

Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	This course introduces medical technology students to the field of medical ethics. The objective of the course is: • To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner • Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**

Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	Health management
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 2. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others;

	• Learn to select, use, and critically analyze current HCMN research and literature; • Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management

	Health personnel management The Strategic Management of Human Resources
Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiographic Techniquse I

1	**Course name**	**Radiographic Techniques I**
2	**Course Code**	RD201
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Physics
7	**Program offered the course**	Medical Radiology Dept.
8	**Instruction Language**	English Language
9	**Date of course approval**	2022
Brief Description:		The course is designed to provide the student with the knowledge base necessary to perform standard imaging procedures of the upper and lower extremity, shoulder and pelvis girdle, and bony

	thorax the. Consideration is given to the evaluation of optimal diagnostic images..
Textbooks required for this Course:	• Eugene D. Frank, et all, (2007). Merrill's Atlas Of Radiographic Positioning & Procedures, Eleventh Edition • Textbook of Radiographic Positioning and Related Anatomy (Plus Bontrager Workbook) by Bontrager, Mosby Systems10th edition • Medical X-Ray Techniques in Diagnostic Radiology: A textbook for radiographers and Radiological Technicians 4th ed. 1980. Softcover reprint of the original 4th ed. 1980 Edition by G.J.van der Plaats , P. Vijlbrief • Bontrager K.L. (2009), Textbook of Radiographic Positioning and Related Anatomy (7th edition), Mosby, ISBN 0-323-05410-2 (UL: 616.0757 BON/X) Supplementary for Practice Placement 2 (PAM2006), Practice Placement 3 (PAM3005) and Skeletal Image Interpretation (PAM3006). • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures Collaborative learning/Team work, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	Up on completion of this course students will be able to: • Understand the concept of anatomy and positioning of x ray radiography. • The practice of different positions. • Identifying pathology in the x-ray image. • Image interpretation in x-ray film. • Radiological investigations • knowing the protocols of x ray in radiology
Course Assessments	Midterm exam 20 % 10% mid-term exam practical 10% participant. 40 % Final Exam 20 % final exam practical. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction Orientation to course and program Explanation of the syllabus and course requirements.
Session 2 (Week 2)	Standard Terminology Radiation safety practices and principles continued terminology associated with radiographic imaging body positions, projections and planes
Session 3 (Week 3)	Positioning Terms Positions, projections, planes and terms related to patient positioning Chest radiography alternate projections/methods
Session 4 (Week 4)	General Planes Introduction to the x-ray tube, Basic x-ray production, Parts and functions

	Anatomy of the chest and mediastinum and Chest radiography basic positions
Session 5 (Week 5)	Skull Landmarks
Session 6 (Week 6)	Terminology of Movement and Direct
Session 7 (Week 7)	Upper extremity: Fingers Investigations
Session 8(Week 8)	• Hand & Wrist Investigations
Session 9 (Week 9 & 10 & 11)	• Forearm & Elbow & Humerus Investigations
Session 10 (Week 12 & 13 & 14 & 15)	• Shoulder Girdle Investigations
Session 11 (Week 16)	• Lower Limb : Toes Investigations
Session 12 (Week 17	**Midterm Exam**
Session 13 (Week 18)	• Foot Investigations
Session 14 (Week 19 & 20)	•Ankle Investigations
Session 15 (Week 21)	• Leg Investigations
Session 16(Week 22 & 23)	• Knee Investigations
Session 17 (Week 24&25)	• Patella Investigations • Femur Investigations
Session 18 (Week 26& 27)	• Pelvic Investigations •Chest Investigations
Session 20(Week 28)	•Ribs Investigations
Session 21 (Week 29)	Revision (questions answering and discussion).
Session 22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiographic Imaging

1	**Course name**	**Radiographic Imaging**
2	**Course Code**	RD203
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course is designed to enable the student to acquire sufficient knowledge to carry out image recording techniques currently employed in medical imaging.
Textbooks required for this Course:	• Adler A, Carlton R, Poelhuis DJ, Kowalczyk NK. Workbook W/Lab Exercises for Principles of Radiographic Imaging. 4th ed. Albany, NY: Delmar Thomson Learning; 2006. • Preview Radiographic Imaging and Exposure 6th Edition – 2020 by Terri Fauber • Principles of Radiographic Imaging: An Art and a Science by Arlene M. Adler and Richard R. Carlton 2012 • Chesney D.N. (1995), Chesney's Radiographic Imaging (6th edition), Blackwell Science, ISBN 0-632-03901-9 (UL: 616.075 CHA)Supplementary for Clinical Imaging 2 (PAM2003). • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Collaborative learning/Team work Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	Up on completion of this course students will be able to: • Identify the principles of photography. • Demonstrate the ability to properly operate imaging equipment and photographic and radiographic aspects of medical imaging. • Determine proper exposure factors to obtain diagnostic quality radiographs. • Demonstrate proper positioning skills. • Demonstrate knowledge of radiation protection principles. • Demonstrate effective oral communication skills. PLEASE OMIT "and program effectiveness data" • Demonstrate written communication skills. • Provide quality patient care.

	• Apply critical thinking skills in the practice of diagnostic radiography. • Effectively analyze/critique radiographic images for diagnostic quality. • Demonstrate ethical integrity consistent with the ARRT Code of Ethics. • Demonstrate professional behavior and values
Course Assessments	Midterm exam 20 % 10% mid-term exam practical 10% participant. 40 % Final Exam 20 % final exam practical. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction
Session 2 (Week 2)	The Photographic & Radiographic Process
Session 3 (Week 3)	Image Characteristics
Session 4 (Week 4)	Photographic Principles
Session 5 (Week 5)	Recording System: Film Materials
Session 6 (Week 6)	Recording System: Film storage
Session 7 (Week 7)	Recording System: Film Cassettes
Session 8(Week 8)	Intensifying Screen speed and Image Quality
Session 9 (Week 9)	Radiographic Processing: Principles
Session 10 (Week 10)	Radiographic Processing: Practice
Session 11 (Week 11)	The Processing Area
Session 12 (Week 12)	Silver Recovery
Session 13 (Week 13-14)	Automated Film-Handling System
Session 14 (Week 15)	Presentation and viewing of Radiographs
Session 15(Week 16)	Storage and archiving of exposed films:
Session 17 (Week 17)	**Midterm Exam**
Session 19(Week 18)	Image Artifacts
Session 21 (Week 19&20)	Image Quality Control
Session 22 (Week 21)	The Fluoroscopic Image
Session 23 (Week 22)	The Image Intensifier
Session 24 (Week 23)	Photofluorography of the intensified image
Session 25 (Week 24&25)	Special Imaging Techniques
Session 26 (Week 26)	Other imaging technologies
Session 27 (Week 27&28)	Computed Radiography
Session 28 (Week 29)	Revision and review
Session 29 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiation physics

1	**Course name**	**Radiation physics**
2	**Course Code**	RD204
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Physics
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Basic principles of radiation physics: radioactivity, the physics of ionizing radiation, radiation dosimetry, imaging equipment, radiation therapy equipment and radiation detectors. The course will include lectures and demonstrations of clinical equipment applications.
Textbooks required for this Course:	• Radiologic Technology. American Society of Radiologic Technologists, Albuquerque, NM. • The Physics of Radiology, 4th Edition, by Johns and Cunningham • Radiation Physics for Medical Physicists (Biological and Medical Physics, Biomedical Engineering) by Ervin B. Podgorsak • http://wwwnaweb.iaea.org/nahu/dmrp/documents/slides/chapter_01_basics_radiation_physics.pdf • A Textbook of Radiation Physics for Radiologic TechnologyMarch 2021Publisher: Samikshya Publication by Suraj Sah and Suraj Sah • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures Collaborative learning/Team work Problem based learning Tutorials (office hours) Class discussion

	Practical Demonstrations
Course Objectives:	Upon completion, successful students will be able to: • Understand the mechanisms describing radioactive decay and the production of ionizing radiation; the interactions of ionizing radiation with matter; • Describe the imaging and treatment equipment used for the clinical care of cancer patients; • Discuss the use of devices and protocols for the accurate measurement of ionizing radiation and calibration of clinical equipment; • Understand the role of the physicist in radiation medicine • Describe electromagnetic spectrum of radiation. • Describe the methods of emissions of secondary ionizing radiation • Describe radiation instrumentation and personnel monitoring devices. • Understand radioactivity and disintegrations
Course Assessments	Midterm exam 20 % 10% mid-term exam practical 10% participant. 40 % Final Exam 20 % final exam practical. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to radiation physics Basics of X-ray Physics
Session 2 (Week 2 &3)	Matter and the atom Atoms, Radiation, and Radioactivity a. Atomic Structure and Transitions b. Nuclear Structure
Session 3 (Week 4)	Interactions of Radiation and Tissue a. Photon Interactions
Session 4 (Week5- 6)	Radiation Measurements and Units a. International System of Units b. The Concept of Dose c. ICRP Weighting factors d. Units e. Radiation Detectors
Session 5 (Week 7-8)	X-Ray Production X-Ray Tubes and Spectra a. Properties of X-Rays b. X-Ray Tube c. Generator Effects on X-Ray Spectrum d. Beam Filtration Effects on X-Ray Spectrum
Session 6 (Week 9)	Common terms related to the x-ray beam
Session 7 (Week10&11)	Basic Concepts in Radiography a. Geometric Considerations b. Image Formation c. Scattered Radiation

Session 8 (Week 12& 13)	Conditions necessary for production
Session 9 (Week 14 & 15)	X-ray emission spectra
Session 10(Week 16)	**Midterm Exam**
Session 11 (Week 17& 18)	Factors that affect emission spectra
Session 12 (Week 19)	Efficiency in production
Session 13(Week 20 & 21)	Interaction of Photons with Matter
Session14(Week 22& 23)	Interaction of Ph Dosimetric Quantities and their Units photons with Matter
Session15(Week 24)	Dosimetry Quantities and their Units
Session16(Week25-26)	Digital Imaging and Radiographic Image Receptors a. Principles of Digital Imaging b. Types of Image Receptors
Session 17(Week 27)	Image Quality in Radiography a. Spatial Resolution
Session 18 (Week 28)	Revision (questions answering and discussion).
Session 19 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiation Protection

1	**Course name**	**Radiation Protection**
2	**Course Code**	RD205
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Physics
7	**Program offered the course**	Medical Radiology Prog.

8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the possible hazards that exist in a radiological department or in any area where ionizing radiation is used for medical uses and to protect himself, population and the environment.
Textbooks required for this Course:	• Bushong S. Radiologic Science for Technologists: Physics, Biology, and Protection. 8th ed. St. Louis, Mo: Mosby; 2001 • An Introduction to Radiation Protection by Alan Martin, Sam Harbison, Karen Beach, Peter Cole 7th edition 2018 • Physics for Radiation Protection: A Handbook, Second Edition by James E. Martin First published:6 June 2006 • https://ehs.ucsc.edu/programs/researchsafety/radiation/documents/rsfw58.pdf • Principles of Radiation Protection: A Textbook of Health Physics by E. E. Stickley • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Collaborative learning/Team work. Problem based learning, Tutorials (office hours). Class discussion, Practical Demonstrations.
Course Objectives:	Upon completing the course, the student will be able to: • Understand the importance of studying radiation protection. • Describe the concept of radiation hazards. • Use professional terminology appropriately. • Identify quantities and units related to radiation protection. • Describe means for radiation protection of staff. • Describe means for radiation protection to patients. • Specify safety concerns related to the use of x-ray equipment. • Describe the effects of radiation on the human body. • Identify genetic effects related to the study of radiation. • Understand the term radiation oncolog
Course Assessments	Midterm exam 20 % 10% mid-term exam practical 10% participant. 40 % Final Exam 20 % final exam practical. A 60% is required for a pass in this course.

Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to radiation protection
Session 2 (Week 2)	Radiation units
Session3(Week3&4&5)	Surveys, Regulatory and Agencies and Regulations
Session 4 (Week 6 & 7)	Safety in Production of X rays and making exposure.
Session 5 (Week 8 & 9)	Methods of radiation protection in diagnostic department
Session 6 (Week 10)	Personnel Monitoring radiation dosimeters
Session 7 (Week 11)	Primary barrier exposure factors
Session8(Week 12& 13)	Consideration Of Risk / Benefits Of Radiation Exposure.

Session 9 (Week14&15)	Application of protection Secondary barrier HVL and tenth-value layer (TVL) Anti scatter Grids
Session 10 (Week 16)	**Midterm Exam**
Session11(Week17&18)	Patient Protection Beam-limiting devices Filtration
Session 12(Week 19)	kV , compression band
Session 13(Week 20)	Protection for pregnant and Pediatric
Session 14(Week 21)	Effect Of Radiation On Pregnancy
Session15(Week 22&23)	A awareness of absorbed dose, dose equivalent and effective dose.
Session16(Week24& 25)	Protection during fluoroscopy interventional radiology- CT
Session17(Week26& 27)	Optimization of image quality and patient dose
Session 18 (Week 28)	Revision (Questions answering and discussion).
Session 18 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب - المقررات الدراسية السنة الثالثة قسم الاشعة الطبية

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications.

	• http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem

	• Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling

	• Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pathology

1	**Course name**	**Pathology**
2	**Course Code**	MT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences, plus investigation of those pathological mechanisms common to all tissue-cell pathology. Attention is paid to the processes of cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Robbins & Cotran Pathologic Basis of Disease (Robbins Pathology) 10th Edition by Vinay Kumar MBBS MD FRCPath Abul K. Abbas MBBS , Jon C. Aster MD PhD 2020 • Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744. • Textbook of pathology by Harsh Mohan 6th edition, ISBN: 978-81-8448-702-2, 2010. • https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation and Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the common terms and definitions used in pathology • Identify of the nature of the disease, including its causes, growth patterns, and consequences • Recognizethe biological characteristics that distinguish each disease from the other. • The ability to distinguish the origin of the disease and how it develops

	The ability to distinguish the origin of the disease and how it develops •That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment •The student will infer the causes of disease and its growth patterns •The student determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Pathology gives explanations of a disease by studying the following four aspects of the disease 1. Aetiology 2. Pathogenesis 3. Morphologic changes 4. Functional derangements and clinical significance •The causes of disease Environmental factors Genetic Factors
Session 2 (Week 2)	**Cell injury.** - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury (Reversible & Irreversible cell injury).
Session 3 (Week 3)	**Cell injury.** - Free radicals (sources, effects & destruction of FR). - Cell injury by chemicals and Cell injury by viruses.
Session 4(Week 4)	**Cell injury.** - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
Session 5 (Week 5)	• **Inflammation .** a. Acute inflammation & its types.
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	• **Repair and healing.**
Session 8 (Week 8)	• **Infectious diseases.** a. Bacterial, Viral, Fungal and Parasitic infection - a general outline b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis & Hydatid disease.
Session 9 (Week 9)	•**Immunopathology.** 1. Immune mechanism of tissue injury: a. Type I hypersensitivity. b. Type II hypersensitivity. c. Type III hypersensitivity. d. Type IV hypersensitivity. e. Tissue transplantation.
Session 10 (Week 10)	2. Autoimmune diseases: a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis.

	c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
Session 11(Week 11)	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
Session 12(Week 12)	• **Nutrition disorder.** Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• **Ionizing radiation.** a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• **Hemodynamic disorders** Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	**GENETIC DISORDERS** a. Single - Gene Defect "Mendalian Disorders" b. Disorders with Multifactorial Inheritance
Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• **Neoplasia.** - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	**Respiratory diseases.** Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	**Cardiovascular diseases .** - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28)	**Revision and discussion**
Session 22(Week29 - 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiographic Technique II

1	**Course name**	**Radiographic Technique II**
2	**Course Code**	**RD301**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Radiographic Technique I
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Radiographic image quality and the effects of exposure variables. This course is designed to re-enforce the student technologist's understanding of the basic concepts of radiation and expand that knowledge with in depth study of Image Quality.The student will be introduced to specialized radiographic techniques
Textbooks required for this Course:	• Eugene D. Frank, et all, (2007).Merrill's Atlas Of Radiographic Positioning & Procedures, Eleventh Edition • Radiographic photography & technique ii with mcqs in radiograph by: niranjan thapa 1st edition. • Intraoral radiographic technique ii by priyadershini rangari 2014 • Radiological Procedures - A Guideline, Textbook of Radiology for residents and technicians • Workbook for Merrill's Atlas of Radiographic Positioning and Procedures by Jeannean Hall Rollins; Bruce W. Long; Tammy Curtis • Bushong, Stewart C.: Radiologic Science for Technologists, 10th edition, ISBN: 978-0-323-08135-1, Elsevier, Mosby Publishing 2013. • Carlton, Richard. Principles of Radiographic Imaging, An Art and Science, 5th edition, Delmar Publishing, ISBN# 10: 1-4390-5872-5 (Required in RADR 1313taught in previously required course • Notes from RADR 1313 Principles of radiographic Imaging • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials, Class discussion and Practical Demonstrations
Course Objectives:	By the end of the semester of instruction the student will:

	• Apply the basic principles of radiographic image acquisition to image quality • Analyze the effects of exposure variables upon image quality • Demonstrate knowledge of advanced modalities utilized in the diagnosticdepartment, ie. mobile, fluoroscopy, and computed tomography • Develop a technique chart • Lab experiments will be done in RADR 2333 to reinforce the material discussed in this course
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Vertebral column investigations
Session 2 (Week 2)	Atlas & axis
Session 3 (Week 3 & 4)	Cervical Vertebrae
Session 4 (Week 5 & 6)	Thoracic Vertebrae
Session 5 (Week 7)	Lumbar Vertebrae
Session 6 (Week 8)	Sacrum
Session 7 (Week 9)	Coccyx
Session 8 (Week 10)	Introduction to skull investigations
Session 9 (Week11,12&13)	Cranium Investigations
Session 10 (Week14,15&16)	Facial Bones Investigations
Session 11 (Week 17	Midterm Exam
Session 12 (Week 18 & 19)	Paranasal sinuses
Session 13 (Week 20 & 21)	Orbital cavity Investigations
Session 14 (Week 22)	Nasal bones
Session 15(Week 23)	Mastoid area
Session 16 (Week 24)	Mandible
Session 17 (Week 25)	Dental Radiography
Session18(Week 26, 27&28)	Abdomen Investigation
Session18(Week 29)	Revision and discussion
Session 20 (Week 30)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Raduation Anatomy (General and Cross Anatomy)

3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Radiation physics/ Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables the students to gain knowledge of anatomical structure of the human body. The contents enable the student to correctly locate human body parts, and structures by surface marking.
Textbooks required for this Course:	• Clinical Anatomy by Systems by Richard S Snell 2006 • Radiological Anatomy Prepared By Amr Attia Hewety 2018 https://jrms.jaf.mil.jo/Files/f4dca080-c9b3-4de6-9d3c-604b6ea2ca16.pdf • W. H. Liao, S. H. Lin, T. T. Wu: A 70-year-old male having advanced prostate cancer presenting with hypercalcemia and diffuse osteoblastic bone metastases: a case report. In: Cases journal Band 2, Nummer 1, 2009, S. 54, ISSN 1757-1626. doi:10.1186/1757-1626-2-54. PMID19144185. Open Access under CC-by-2.0 • Human Sectional Anatomy Pocket atlas of body sections, CT and MRI images, Fourth edition By Adrian Kendal Dixon, David J. Bowden, Bari Logan, Harold Ellis 2017 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Collaborative learning/Team work Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	Up on comlection of the course the participants should be able to: • Understand various terminology used in anatomy and its sub-divisions. • Describe the anatomical implications of cancer spread. • Discuss 3D relationships of organs and their surrounding structures. • Identify tissues and organs at risk from either cancer spread or treatment delivery. • Demonstrate key concepts in radiological and cross sectional anatomy with reference to oncology.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60%

	A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction
Session 2 (Week 2)	Bones
Session 3 (Week 3)	Skin & Fasciae
Session 4 (Week 4)	Joints and Muscles
Session 5 (Week 5 & 6 & 7)	Bones, joints and ligaments of the upper limb
Session 6 (Week 8 & 9 & 10)	Bones, joints and ligaments of the lower limb
Session 7 (Week 11 & 12)	Vertebra & vertebral column
Session 8 (Week 13)	Joints & ligaments of vertebral column
Session 9(Week 14 & 15)	Skull & mandible
Session 10 (Week 16)	**Midterm Exam**
Session 11(Week 17)	Bony Pelvis
Session 12(Week 18)	Thoracic cage
Session 13 (Week 19)	Respiratory system
Session 14 (Week 20)	Cardio-vascular system
Session 15 (Week 21)	Alimentary system
Session 16 (Week 22)	Urinary system
Session 17 (Week 23)	Reproductive system (male)
Session 18 (Week 24)	Reproductive system (female)
Session 19 (Week 25)	Endocrine glands
Session 20 (Week 26)	Lymphatic system
Session 21 (Week 27)	Central nervous system
Session 22 (Week 28)	Special sense organs
Session 23 (Week 29)	Revision and discussion
Session 24 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

CT, US & MRI Physics

1	**Course name**	**CT, US & MRI Physics**
2	**Course Code**	RD303
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Physics/Protection Physics
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course is designed to introduce the student to the principles physics of the Computerized Tomography, Magnetic resonance Imaging and ultra sound devices.
Textbooks required for this Course:	• John Ball, Adrian D Moore, Essential Physics for Radiographers, Third Edition • https://rads.web.unc.edu/wpcontent/uploads/sites/12234/2018/05/Phy-MRI-Made-Easy.pdf • Magnetic Resonance Imaging: Physical Principles and Sequence Design, 2nd Edition by Robert W. Brown, Y.-C. Norman Cheng, E. Mark Haacke, Michael R. Thompson, Ramesh Venkatesan 2014 • Diagnostic Radiology Physics A Handbook for Teachers and Students by D.R. Dance S. Christofides A.D.A. Maidment I.D. McLeanK.H. Ng Technical Editors 2014 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	2 * 28 = 56 teachin hours
Delivery	Lectures, Problem based learning, Tutorials,Class discussion and Practical Demonstrations
Course Objectives:	Up on complecton of the course te studnets shoud be able to: • Understand the fundamentals of medical imaging, including the basic physics and engineering associated with each imaging modality (CT, MRI, PET, and ultrasound), as well as mathematics and computational tools associated with image reconstruction and image processing. • Apply fundamental mathematical and engineering principles (sampling, Fourier transform, linear systems) in the development of imaging systems and image acquisition. • Develop understanding of the interactions between electromagnetic, acoustic, or other forms of energy and biological tissues and apply these principles to imaging system design.

	• Apply understanding of imaging system physics and instrumentation to design systems or subsystems for specific applications for X-ray, computed tomography, PET/SPECT, MRI, and ultrasound. • -Utilize understanding of imaging physics and imaging systems engineering principles in order to reconstruct acquired data into images. • Quantitatively compare imaging performance and tradeoffs within and across imaging modalities using criteria including contrast, spatial resolution, contrast-to-noise ratio, and signal-to-noise ratio
Course Assessments	Quizzes 5 % Mid-term exam 20 % Activities 10 % Attenedances 5 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Historical Background and nature of ultrasound
Session 2 (Week 2)	Acoustic Intensity and Power Acoustic Reflection
Session 3 (Week 3 & 4)	Acoustic Absorption and Attenuation Image resolution
Session 4 (Week 5)	Wave theory and Equation.
Session 5 (Week 6)	Ultrasound instrumentation
Session 6 (Week 7)	Doppler Ultrasound
Session 7 (Week 8)	Real-Time Imaging
Session 8 (Week 9)	Basic principles of diagnostic ultrasound images artifacts
Session 9 (Week 10)	Biological effects of ultrasound
Session 10 (Week 11)	Physical principle of Magnetism
Session 11 (Week 12)	Basic terminology related to MR imaging
Session 12 (Week 13)	NMR Signal Production
Session 13 (Week 14)	Tissue Characteristics
Session 14 (Week 15)	Pulse Sequencing
Session 15 (Week 16)	Brief overview of clinical applications of MRI
Session 16 (Week 17)	Brief overview of imaging parameters
Session 17 (Week 18)	**Midterm Exam**
Session 18 (Week 19)	Instrumentation
Session 19 (Week 20)	Imaging Parameters and image quality/Options
Session 20 (Week 21)	Patient preparation and monitoring
Session 21 (Week 22)	Basic patient and personnel safety
Session 22 (Week 23)	Historical Background and nature of CT
Session 23 (Week 24)	Physical principle of CT.
Session 24 (Week 25)	Describe CT generations
Session 25 (Week 26)	Describe factors controlling image appearance
Session 26 (Week 27)	Identifying CT artifacts
Session 27 (Week 28)	Revision (Question answering and discussion).
Session 28 (Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all

	aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Nuclear Medicine & Radiotherapy Physics

1	**Course name**	**Nuclear Medicine & Radiotherapy Physics**
2	**Course Code**	RD304
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Physics/Radiation Physics
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course aims at giving theoretical and practical knowledge of diagnostic and therapeutic nuclear medicine physics and to prepare for work as a medical physicist in nuclear medicine. The course includes the principles of radiopharmaceutical imaging, quality assurance, radiation dosimetry and radiation safety.
Textbooks required for this Course:		• Faiz M. Khan, PhD, The Physics of Radiation Therapy, ISBN 978-1-4511-8245-3 • Nuclear Medicine Physics Edited By Joao Jose De Lima 1st edition 2011 • An Introduction to the Physics of Nuclear Medicine by Laura Harkness-Brennan 2018 • Walter and Miller's Textbook of Radiotherapy: Radiation Physics, Therapy and Oncology 8th edition. • Handbook of Radiotherapy Physics Theory and Practice, Second Edition, 2021 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration		4 * 28 = 112 teaching hours
Delivery		Lectures, Problem based learning, Tutorials

	Class discussion, Practical Demonstrations
Course Objectives:	On completion of the course, the student should be able to; • know how to measure the different types of radiation energies from different radio therapeutic units and source, using the various types of radiation measuring instrument (Dosimetry), distribution and calculation of radiation treatment dose for the different types of radiation. • Describe the technical structure and physical the background of the Gamma camera and the PET camera, • Describe the production and absorption mechanism of the radiopharmaceuticals. • Apply radiation protection regulations in connection with nuclear medical examinations. • Calculate the dose, complete and inject radiopharmaceuticals. • Apply current methodology in commonly occurring examinations within nuclear medicine on the basis of the referral, present an evaluation of a common nuclear medical study. • Analyse a nuclear medical study in order to obtain a diagnostic understanding thereby. • Be familiar with structure and use of PET-CT.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to the physics of radiotherapy and nuclear medicine
Session 2 (Week 2)	Instrumentation
Session 3 (Week 3 & 4)	Emission computed tomography
Session 4 (Week 5)	Single Photon Emission Computed Tomography SPECT
Session 5 (Week 6)	Positron Emission Tomography
Session 6 (Week 7)	Radiochemistry and Radio pharmacy
Session 7 (Week 8)	Gallium and indium radiopharmaceuticals
Session 8 (Week 9)	Thallium chloride
Session 9 (Week 10)	Iodinated radiopharmaceuticals
Session 10 (Week 11)	PET radiopharmaceuticals
Session 11 (Week 12)	Therapeutic radiopharmaceuticals
Session 12 (Week 13)	General radiation safety practices and training
Session 13 (Week 14)	Contamination control
Session 14 (Week 15)	Spills and accidents.
Session 15 (Week 16)	Radioactive waste disposal
Session 16 (Week 17)	**Midterm Exam**
Session 19 (Week 18)	Types of radiation therapy devices
Session 20 (Week 19)	Types of radioactive sources used in radiation therapy
Session 21 (Week 20)	Types of radiation dosimeters
Session 21 (Week 21)	Methods for measuring and compiling radiation dose data
Session 22 (Week 22)	Methods for calculating radiation doses for radiotherapy.
Session 23 (Week 23)	How to generate technetium-99 and its use in radiological surveys

Session 24 (Week 24)	Calculation method for radioactive iodine-131 used in thyroid treatment
Session 25 (Week 25)	Positron beam scanning device
Session 26 (Week 26)	Silicontronic accelerator device
Session 27 (Week 27)	Revision and discussion
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Oncology

1	**Course name**	**Oncology**
2	**Course Code**	**RD305**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Pathology
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course focus on cancer and current treatment modalities with emphasis on radiation therapy, and provide students with a fundamental understanding of oncology and orientation to the guiding principles of multidisciplinary oncological management and life as a modern oncologist.
Textbooks required for this Course:	• The Biology of Cancer Second Edition by Robert A Weinberg 2013

	• Oxford Textbook of Oncology (3rd edition) ArrowDavid J. Kerr (ed.), Daniel G. Haller (ed.), Cornelis J. H. van de Velde Michael Baumann 2016 • Oxford Textbook of Cancer Biology by Francesco Pezzella, Mahvash Tavassoli, David Kerr 2019 • https://www.desouzainstitute.com/wpcontent/uploads/Course_Syllabus-FONP-Jan-2016-v01_0.pdf • file:///C:/Users/BMI/Downloads/medical_oncology_otr_e.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Collaborative learning/Team work Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the various terms used in the field of oncology. • Introducing the general principles of tumor diagnosis using modern radiological techniques. • Introducing the biological characteristics of tumors on which diagnostic and radiotherapy strategies are based • Introducing the general principles of treating tumors using modern radiological techniques
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to tumors and Definitions
Session 2 (Week 2)	Epidemiology of cancer
Session 3 (Week 3)	Carcinogenesis and etiology of cancer
Session 4 (Week 4)	Diagnosis of cancer and classification of tumors
Session 5 (Week 5)	Staging of cancer
Session 6 (Week 6)	Cancer problems
Session 7 (Week 7)	Spread of cancer
Session 8 (Week 8)	Doubling time, cell cycle
Session 9 (Week 9)	DNA synthesis and replication
Session 10 (Week 10)	DNA damage and repair
Session 11 (Week 11)	Hallmarks of cancer cells
Session 12 (Week 12)	Principles of chemotherapy
Session 13 (Week 13)	Cell cycle and mechanism of action of chemotherapeutics
Session 14 (Week 14)	Inducing angiogenesis & activating invasion & metastasis.
Session 15 (Week 15)	Drug resistance
Session 17 (Week 16)	**Midterm Exam**
Session 18 (Week 17)	Pharmacological factors
Session 19 (Week 18)	Classifications of chemotherapy agents
Session 20 (Week 19)	Hormones in treatment and causation of cancer
Session21(Week20-28)	Clinical- epidemiological study of: Breast cancer , Lymphoma , Lung, Larynx , Ovary , Body uterus and CX. • Bone cancer • Brain cancer

	• G. I tumors • Uterine cancer • Cervical cancer
Session 22 (Week 29)	Revision and discussion
Session 23 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiation Biology

1	**Course name**	**Radiation Biology**
2	**Course Code**	RD306
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Biology/Radiation physics/Radiation protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		The course is designed to enable the student to focus on understanding the effects of ionizing radiation on the living cells, the mechanisms by which they produce these effects on the different types of tissue and to differentiate between the various types of tissues according to their radio sensitivities.
Textbooks required for this Course:		• Bushong S. Radiologic Science for Technologists: Physics, Biology, and Protection. 8th ed. St. Louis, Mo: Mosby; 2001 • Radiation Biology: A Handbook for Teachers and Students 2010 • Basic Radiation Biology Carl F. von Essen 1968, https://doi.org/10.1148/91.3.592

	• Radiation Biology for Medical Physicists By C. S. Sureka, Christina Armpilia 1st edition 2017 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning,Tutorials ,Class discussion and Practical Demonstrations
Course Objectives:	Upon successful completion of this course, the student should be able to: • Understand types of ionizing radiation • Identify the molecular effects of radiation • Identify the types of radiation effects. • Correlate the radiation sensitivity and response • Describe the structures and functions of the human cell. • Differentiate between somatic and germ cells. • Describe the process of cell division for both somatic and germ cells. • Describe the principles of target theory. • Distinguish between direct and indirect effect of radiation on cells. • Describe the physical factors that affect radiation reponse. • Describe the biological factors affect raditation response. • Evaluate the radiosensitivity of tissue andorgans. • Describe the purpose and construction of dose-response relationship curves. • Identify the different types of dose-response relationship curves. • Describe the stages of acute radiation syndrome and the radiation dose ranges associated with each specific syndrome. • Describe local tissue effects following exposure to high doses of radiation and the dose ranges associated with each specific effect. • Explain the long-term effects associated with excessive radiation exposure. • Discuss the correlation between radiation exposure and malignancy. • Discuss embryo and fetal effects of radiation exposure
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Review of cell Biology
Session 2 (Week 2)	Types of ionizing radiation
Session 3 (Week 3 & 4)	Molecular effects of radiation
Session 4 (Week 5)	The deposition of radiant energy
Session 5 (Week 6 & 7)	Cellular & Sub-cellular radiation effects
Session 6 (Week 8 & 9)	Individual radiation effects

Session 7 (Week 10&11)	Stochastic (probabilistic) effects
Session 8 (Week 12)	Law of Bergonié and Tribondeau
Session 9 (Week 13)	Cell survival and recovery
Session 10(Week 14 & 15)	Systemic response to radiation
Session 11(Week 17& 18)	Radiation dose-response curves
Session 12(Week 19)	**Midterm exam**
Session 13(Week 19 & 20)	Total body irradiation
Session 14 (Week 21 & 22)	Late effects of radiation
Session 15 (Week 23 & 24)	Non-stochastic (deterministic) effects
Session 16(Week 25 & 26)	Genetic effects
Session 17 (Week 27&28)	Occupational risks for radiation workers
Session 18 (Week 29)	Revision (questions answering and discussion)
Session 19 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiation & Pharmacology

1	**Course name**	**Radiation & Pharmacology**
2	**Course Code**	**RD307**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will provide how a drug affects a biological system and how the body responds to the drug. The discipline encompasses the sources, chemical properties, biological effects and therapeutic uses of drugs.	

Textbooks required for this Course:	• Lippincott Illustrated Reviews: Pharmacology / Edition 7 by Karen Whalen PharmD, BCPS 2018 • Pharmacology and Drug Administration for Imaging Technologists 2nd Edition - October 6, 2005 • A Textbook of Clinical Pharmacology and Therapeutics 5th edition 2008 • Chemistry and Pharmacology of Anticancer Drugs • By David E. Thurston, Ilona Pysz 2nd edition 2021 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion. self-directed activities.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire new knowledge in pharmacology by conducting and promoting innovative research. • Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs. • Report the clinical applications, side effects of drugs used in medicine. • Translate pharmacological principles into clinical decision making.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**A.General pharmacology:** • Introduction. • Drug sources. • Routes of drug administration. • Pharmacokinetics.
Session 2 (Week 2)	**A.General pharmacology:** • Pharmacodynamics. • Drug adverse effects and toxicity. • Drug-drug interactions.
Session 3 (Week3)	**B.Autonomic nervous system**: • Introduction. • Sympathomimetics. • Sympathetic depressants.
Session 4 (Week4)	**B.Autonomic nervous system**: • Parasympathomimetics. • Parasympathetics depressants.
Session 5 (Week5)	**B.Autonomic nervous system**: • Drug acting on autonomic ganglia. • Skeletal muscle relaxants. • Drug acting on the eye.

Session 6 (Week 6	**C. Autacoids:** • Histamine & serotonine. • Prostaglandins & eicosanoids. • Vasoactive peptides.
Session7 (Week 7)	**D. Central nervous system:** • Introduction. • Sedative & hypnotics.
Session8 (Week 8)	**D. Central nervous system:** • Analgesics and antipyretics & NSAID. • Narcotic analgesics. • Anticonvulsants & antiepileptics
Session9 (Week 9)	**D. Central nervous system:** • Antiparkinsonian drugs. • Antipsychotics and antianxiety & antidepressants. • Local & general Anaesthetic.
Session 10 (Week 10)	**E. Cardiovascular system:** • Antihypertensive & antishock drugs. • Cardiac glycosides and congestive heart failure. • Antiarhythemic drugs. • Drugs used in angina pectoris.
Session 11(Week 11)	**. F. Blood:** 1. Coagulants, anticoagulants, fibrinolytics & antiplatelets. 2. Drugs used in treatment of anemia. 3. Drugs used in treatment of hyperlipidemia.
Session 12 (Week 12)	**G. Chemotherapy:** • Sulphonamides & quinolones. • B-lactum antibiotics (penicilins, cephalosporins).
Session 13 (Week 13)	**G. Chemotherapy:** • Chloramphenicol & tetracyclines. • Aminoglucosides antibiotics. • Antifungal drugs
Session 14 (Week 14)	**G. Chemotherapy:** • Antiviral drugs. • Antituberculus. • Antimalarial drugs & antiprotozoal.
Session15 (Week 15)	**Midterm exam**
Session16 (Week 16)	**H. Endocrie drugs:** • Antidiabetics drugs. • Antithyroid drugs.
Session 17 (Week 17)	**H. Endocrie drugs:** • Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).
Session 18 (Week 18)	**H. Endocrie drugs:** • Corticosteroids. • Sex hormones, contraceptives drugs.
Session 19 (Week 19)	**I. Respiratory system:** • Drugs used in treatment of bronchial asthma.

Session 20(Week 20)	**I. Respiratory system:** • Cough therapy. • Gas therapy
Session 21 (Week 21)	**J. GIT:** • Drugs used in treatment of peptic ulcer • Antiemetic drugs. • Drugs used in treatment of constipation and diarrhea. • Antispasmodics.
Session 22 (Week 22)	**K. Urinary tract:** 1. Diuretics. 2. Urinary tract infection.
Session 23 (Week 23)	**Medicines used in preparing the patient in the radiology department, for example:** *Laxatives *painkillers * local anesthetics * Sedative medications
Session 24 (Week 24)	**Medicines for diagnostic radiology departments** * Contrast fluids and materials used for radiological diagnosis of the patient. *Definition of negative contrast materials, positive contrast materials.
Session 25 (Week 25)	Definition of iodine, organic iodine compounds, oils saturated with iodine. * Organic iodine compounds used in radiographic imaging of the urinary tract and blood vessels. * Organic iodine compounds used in radiography of the gallbladder, either orally or intravenously. * Other organic iodine compounds.
Session 26 (Week 26)	Various other types and materials of contrast media used in medical diagnostic radiology, especially those used in computer tomography and magnetic resonance imaging.
Session27(Week27-28)	Medicines for radiotherapy and nuclear medicine departments
Session 28 (Week 29)	Revision (questions answering and discussion)
Session 29 (Week 30)	Final exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospitals Practical Training I

1	**Course name**	**Hospitals Practical Training I**
2	**Course Code**	RD308
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Radiographic Technique/Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course focuses on learning to perform radiographic procedures of the radiographic techniques I & II. In addition of the special examination, radiation protection, ethics and professional conducts. Subsequent hands-on experience is provided under the direct supervision of qualified radiographers.
Textbooks required for this Course:	• Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002. • College of Radiographers (2006), Health Care Associated Infections (HCAIs) Practical Guidance and Advice, Society and College of Radiographers, ISBN 1-87110-139-5 (UL: XXX) • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	6 * 28 = 168 teaching hours
Delivery	Collaborative learning/Team work, Problem based learning Class discussion, Practical Demonstrations
Course Objectives:	Up on completion of the course students should be able to: • Apply the practical skills through clinical training in the hospital. • Develop radiographic technology skills for RAD 301, RAD 201. • Apply patient care skills and methods of protection from the dangers of radiation. • Apply X-ray image quality assessment. • Begin applying the acquired knowledge and skills clinically.
Course Assessments	Clinical Practice Assessment 70 % Clinical Practice Record Book 20 % Activity 5 % Attendence 5 %
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Diagnostic Radiography positioning
Session 2 (Week 2)	Radiographic anatomy
Session 3 (Week 3)	Image evaluation
Session 4 (Week 4)	Radiation hazards and protection
Session 5 (Week 5)	Upper extremity: Fingers Investigations
Session 6 (Week 6)	• Hand & Wrist Investigations

Session 7 (Week 7)	• Forearm & Elbow & Humerus Investigations
Session 8 (Week 8)	• Shoulder Girdle Investigations
Session 9 (Week 9)	Lower Limb : Toes Investigations
Session 10 (Week 10,11)	• Foot Investigations and •Ankle Investigations
Session 12 (Week 12)	• Leg Investigations
Session 13 (Week 13)	• Knee Investigations
Session 14 (Week 14)	• Patella Investigations
Session 15 (Week 15)	• Femur Investigations
Session 16 (Week 16	**Midterm Exam**
Session 17 (Week 17)	• Pelvic Investigations
Session 18 (Week 18)	•Chest Investigations
Session 19 (Week 19)	•Ribs Investigations
Session 20 (Week 20)	Cervical Vertebrae
Session 21 (Week 21)	Thoracic Vertebrae
Session 22 (Week 22)	Lumbar Vertebrae
Session 23(Week 23)	Sacrum
Session 24 (Week 24)	Coccyx
Session 25 (Week 25)	Skull investigation
Session 26(Week 26)	Abdomen Investigation
Session 27 (Week 27)	Dental Radiography
Session28(Week28-29)	Revision (questions answering and discussion)
Session 29 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج. المقررات الدراسية السنة الرابعة قسم الأشعة الطبية

Radiographic Technique III

1	**Course name**	**Radiographic Technique III**
2	**Course Code**	**RD401**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours oer week
6	**Pre-requisite requirements**	Radiographic Technique I/ Radiographic Technique II / Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course is continuity to Radiographic Technique & Anatomy (I, II). The course is designed to provide the student with the knowledge base necessary to perform standard imaging procedures for the all contrast media Investigation. And the course is designed to provide the student with basic knowledge of Interventional Radiology
Textbooks required for this Course:	• Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002. • A Textbook of Radiographic Technique By: Mr. Niranjan Thapa, Mukunda Prasad Humagain 1st edition, 2019 • Medical X-Ray Techniques in Diagnostic Radiology: A textbook for radiographers and Radiological Technicians 4th ed. 1980. Softcover reprint of the original 4th ed. 1980 Edition by G.J.van der Plaats , P. Vijlbrief (Assistant) • Textbook of Gastrointestinal Radiology 3rd Edition - October 24, 2007 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	Up on complection of this course student will be able to: • Demonstrate accuracy in radiation protection for the patient, personnel, and self. • Exhibit knowledge, understanding, and dexterity in the proper use of radiographic equipment. • Adhere to the program's standards of attendance, punctuality, and dependability. • Conduct self in a professional manner with co-workers, the public, and other hospital staff.

حكومة الوحدة الوطنية
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وزارة التعليم العالي والبحث العلمي

	• Apply theory to practice by exhibiting ongoing, satisfactory job performance skills. • Select proper technical factors for radiographic procedures on an average patient. • Exhibit proper positioning skills as outlined by department protocol. • Demonstrate knowledge and understanding of various nursing procedures and basic patient care. • Develop and deliver an oral presentation as outlined in the Clinical Education Manual. • Demonstrate competence on radiographic procedures of the cervical, thoracic and lumbar spines, sacrum and coccyx, and skull as outlined in the Clinical Education Manual. • Critique images of the cervical, thoracic and lumbar spines, sacrum and coccyx, and skull for radiographic quality
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1 & 2)	Introduction To Contrast Media
Session 2 (Week 3 & 4)	Types of To Contrast Media
Session 3 (Wee 5 &6& 7)	Barium Investigations (Gastrointestinal tract)
Session 4 (Week 8)	Cholecystography
Session 5 (Week 9)	Intra Venous Urographg (Urinary System)
Session 6 (Week 10 & 11)	Respiratory system
Session 7 (Week 12 & 13)	Bronchography
Session 8 (Week 14)	Mammography
Session 9 (Week 15)	Female genital tract
Session 10 (Week 16)	**Midterm exam**
Session 11(Week 17 & 18)	Angiography
Session12(Week 19 & 20)	Arthrography
Session 13 (Week 21& 22)	Myelography
Session 14 (Week 23&24)	Catheter Angiography
Session 15 (Week 25)	Stereotactic Breast Biopsy
Session 16 (Week 26&27)	Needle Biopsy of Lung (Chest) Nodules Trans jugular Intrahepatic Porto systemic Shunt (TIPS) Endovenous Ablation of Varicose Veins
Session 17 (Week 28)	Thrombolysis and Uterine Fibroid Embolization
Session 18 (Week 29)	Revision (equations answering and discussion).
Session 19 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal

	communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiographic Pathology and Image Interpretation

1	**Course name**	**Radiographic Pathology and Image Interpretation**
2	**Course Code**	RD402
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Pathology / Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences and will develop knowledge and gain practical skills in image interpretation and develop a comprehensive understanding of the role of different imaging modalities in diagnosis of pathology,and provides them with the underpinning theory and practice of radiographer reporting systems and develops skills of providing informed opinions.
Textbooks required for this Course:	• General and Systematic Pathology: With student consult Online Access 4th Edition by James C. E. Underwood 2004 • Comprehensive Radiographic Pathology 7th Edition by Ronald L. Eisenberg MD JD FACR Nancy M. Johnson MEd 2020 • Chesney D.N. et al. (1994), Chesney's Equipment for Student Radiographers, Blackwell Science, ISBN 0-63-202724-X (UL: 616.0757 CHE) Supplementary for Clinical Imaging 3 (PAM2004). • Eisenberg R.L. and Johnson N.M. (2012), Comprehensive Radiographic Pathology (5th edition), Mosby, ISBN 978-0-323-07847-4 (UL: 616.07572 EIS)Text for Pathology for Radiographers (PAM2012). • Hader D.P. (2001), Image Analysis: Methods and Applications (2nd edition), CRC Pres, ISBN 0-84-930239-0 (UL: 578 HAD) • Supplementary for Digital Image Processing for Radiographers (PAM3012).

	• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based Group interaction and discussion. self-directed activities. active participation and Laboratory experiments.
Course Objectives:	Up on completion of this course, students will be able to: • Extend X-Ray Image Interpretation abilities through a methodological approach to image analysis in an emergency or trauma setting. • Recognise and identify the imaging appearances of the normal axial and appendicular skeleton, chest and abdominal structures and their normal variations; • Apply facts, concepts and terms related to the common types of abnormality and diseases of each of the organ systems and recognise their imaging appearances; • Critically evaluate and analyse images with regard to technical quality and anatomical detail and develop strategies for improvement when necessary; • Demonstrate an understanding of the use of medical imaging in patient management and its appropriate use; • Recognise and describe the diagnostic limitations of various imaging modalities; • Apply the basic principles involved in systematic interpretation of radiographic images; • Describe and practice the principles of radiographer reporting systems and express informed opinion by utilising rational and rigorous argument; • Demonstrate critical and independent thinking which reflects current theory and practice. • Develop important clinical judgement and decision-making skills to shape future practice and boost confidence in emergency image interpretation and help deliver better outcomes for patients
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Aetiology • Pathogenesis • Morphologic changes • Functional derangements and clinical significance
Session 2 (Week 2)	• **The relationship of radiation with diseases.** Definition of x-rays. types of rays
Session 3 (Week 3)	• **The relationship of radiation with diseases.** The effect of radiation on living cells and the relationship of radiation to cancer. The role of radiology in the diagnosis and treatment of diseases

Session 4 (Week 4)	• General pathological events that are cleansed by x-rays.
Session 5 (Week 5)	• Orthopedic diseases: - Fractures, their types and their purification by x-rays, complications of fractures.
Session 6(Week 6)	• **Orthopedic diseases: -** Complete fracture, bone infection, bone tumors. Joint diseases.
Session 7 (Week 7)	• **Respiratory diseases: -** Upper respiratory diseases. Lower respiratory diseases.
Session 8 (Week 8)	• Respiratory diseases: - Bronchitis and Pneumonitis and bronchitis.
Session 9 (Week 9)	• **Respiratory diseases: -** Bronchiectomy. Lung cancer and tumors.
Session10(Week10)	• **Gastrointestinal diseases: -** Salivary gland and Esophagus.
Session11(Week11)	• **Gastrointestinal diseases: -** Stomach and duodenum. Liver and pancreas.
Session12(Week12)	• **Gastrointestinal diseases: -** Small and large intestine. Acute abdominal conditions.
Session12(Week12)	• **Liver and bile duct diseases- :** Gallstones, tumors. Hypertrophy and its types, obstruction of the bile ducts, jaundice.
Session13(Week13)	**Midterm Exam**
Session14(Week14)	• **Cardiovascular diseases:-** Rheumatism and its effect on the heart valves and Coronary thrombosis.
Session15(Week15)	• **Cardiovascular diseases:-** High blood pressure and Congestive heart.
Session16(Week16)	**Midterm practical exam**
Session17(Week17)	• **Cardiovascular diseases:-** Varicose veins and Vein thrombosis.
Session18(Week18)	• **Urinary system diseases: -** Congenital anomalies and Chronic acute nephritis.
Session19(Week19)	• **Urinary system diseases: -** Urinary tract stones and Urinary bladder diseases.
Session20(Week20)	• **Diseases of the female and male reproductive system- :** Congenital anomalies and Tumors.
Session21(Week21)	• **Diseases of the female and male reproductive system- :** Infections. Infertility and its cause.
Session22(Week22)	• **Endocrine diseases.**
Session23(Week23)	• **Endocrine diseases.**
Session24(Week24)	• **Nervous system diseases: -** Brain diseases, Brain tumors.
Session24(Week25)	• **Nervous system diseases: -** Spinal cord diseases, Spinal cord tumors.

محكورة الوحدة الوطنية
العزيز
وزارة التعليم العالي والبحث العلمي

Session2 (Week 26)	• **Nervous system diseases: -** Slipped disc. And congenital anomalies.
Session27(Week27)	• **Nervous system diseases: -** Radiological diseases of the brain and spinal cord.
Session28(Week28)	• **Revision and discussion**
Session28(Week29-30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

CT, MRI & US Techniques

1	**Course name**	**CT, MRI & US Techniques**
2	**Course Code**	RD403
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	CT, MRI & US physics
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	The course is designed to enable the student to enumerate, outline, and discuss the CT, MRI and ultrasound procedures conducted in the medical Imaging departments as well as the indications and preparation for different types of scans	
Textbooks required for this Course:	• Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002. • Textbook of Radiology for CT and MRI Technicians with MCQsKindle Edition by Sachin Khanduri 2017 • Textbook of Radiology for CT and MRI Technicians with MCQs Sachin Khanduri 1st edition 2018	

	• https://pubs.rsna.org/doi/abs/10.1148/radiology.175.3.814?journalCode=radiology • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives	Up on completion of this course the student should be able to: • Describe the basic principles and concepts of CT, MRI and ultrasound. incorporate scanning techniques learned to best demonstrate anatomy and disease. • Recognize CT, MRI and ultrasound artifacts and describe techniques to minimize their occurrence. • Compare the advantages and disadvantages of all of these diagnostic tools. • Demonstrate general characteristic features of CT, MRI and US techniques • Knowledge of portable and mobile equipment used in radio imaging techniques.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Principles of scanning Techniques Limitation of ultrasound as a technique and Use of equipment
Session 2 (Week 2)	Obstetrics gynecology and Newborn
Session 3 (Week 3,4,5)	Urinary system, Blood vessels and The abdomen
Session 6 (Week 6)	Cardiology and Echo cardiology colour Doppler
Session 7 (Week 7, 8)	Head and Ophthalmology
Session 9 (Week 9 & 10)	Thyroid, breasts, and testes
Session 10 (Week 11)	Biopsy sampling techniques
Session 11 (Week 12)	Cross-infection
Session 12 (Week 13)	Difficulties of examination in case of post-operative patients
Session 14 (Week 14)	Introduction to C T Scan
Session 15 (Week 15)	Describe factors controlling image appearance and Identifying CT artifacts
Session 17 (Week 16)	**Medterm Exam**
Session 17 (Week 17)	C T Contrast Media
Session16(Week18,19,20&21)	CT Applications
Session 17 (Week 22)	CT Angiography
Session 17 (Week 23)	Introduction to MRI, Basic terminology related to MRimaging And Tissue Characteristics
Session 17 (Week 24)	Brief overview of imaging parameters, Instrumentation and Imaging Parameters and image quality/Options
Session 17 (Week 25)	Patient preparation and monitoring Basic patient and personnel safety
Session 17 (Week 26)	MRI Contrast Media
Session17(Week27,28,29&30)	Clinical applications of MRI
Session 17 (Week 31)	MRI Angiography
Session 20 (Week 32)	**Final Exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Nuclear Medicine Techniques

1	**Course name**	**Nuclear Medicine Techniques**
2	**Course Code**	RD404
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Radiation protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		The course is designed to provide the student with the clinical aspects of different nuclear medicine procedures, skills and Techniques necessary to operate all nuclear medicine devices with high professional efficiency.
Textbooks required for this Course:		• Nuclear Medicine Technology: Procedures and Quick Reference, Second Edition, Pete Shackett • Nuclear Medicine and PET/CT: Technology and Techniques 8th Edition by David Gilmore, Kristen Waterstram-Rich MS CNMT NCT FSNMTS 2016 • Nuclear Medicine Textbook: Methodology and Clinical Applications 1st ed. 2019 Editionby Duccio Volterrani (Editor), Paola Anna Erba (Editor), Ignasi Carrió (Editor), H. William Strauss (Editor), & 1 more

	• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	On completion of the course, the student should be able to; • Applying basic nuclear medicine methods in various medical specialties, including heart, children, and others. Training in new and innovative treatment methods at the molecular levels within the body. • Describe the technical structure and physical the background of the Gamma camera and the PET camera, • Describe the production and absorption mechanism of the radiopharmaceuticals. • Apply radiation protection regulations in connection with nuclear medical examinations. • Calculate the dose, complete and inject radiopharmaceuticals. • Apply current methodology in commonly occurring examinations within nuclear medicine. on the basis of the referral, present an evaluation of a common nuclear medical study. • Analyse a nuclear medical study in order to obtain a diagnostic understanding thereby. • Be familiar with structure and use of PET-CT. • Working in all fields of radiology
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Nuclear Medicine 1
Session 2 (Week 2)	Introduction to Nuclear Medicine 2
Session 3 (Week 3)	Patient care in nuclear medicine 1
Session 4 (Week 4)	Patient care in nuclear medicine 2
Session 5 (Week 5)	Nuclear Medicine Protocols
Session 6 (Week 6)	Review 1
Session 7 (Week 7)	Thyroid scan and uptake
Session 8 (Week 8)	Radioactive iodine therapy 1
Session 9 (Week 9)	Radioactive iodine therapy 2
Session 10 (Week 10)	Parathyroid Scintigraphy
Session 11 (Week 11)	Bone scan
Session 12 (Week 12)	Lungs V/Q scan 1
Session 13 (Week 13)	Lungs V/Q scan 2
Session 14 (Week 14)	Renal scintigraphy 1
Session 15 (Week 15)	Renal scintigraphy 2
Session 16 (Week 16)	Liver and spleen Imaging
Session 17 (Week 17)	**Midterm exam**

Session 18 (Week 18)	Cholescintigraphy
Session 19 (Week 19)	Nuclear Cardiology 1
Session 20 (Week 20)	Nuclear Cardiology 2
Session 21 (Week 21)	GIT imaging 1 and GIT imaging 2
Session 23 (Week 22)	Review 2
Session 24 (Week 23)	Lymphoscintigraphy
Session 25 (Week 24)	Infection and inflammation
Session 26 (Week 25)	Central Nervous System imaging 1
Session 27 (Week 26)	Central Nervous System imaging 1
Session 28 (Week 27)	Oncology SPECT and Oncology PET
Session30(Week28)	Bone Palliation and radiosynovectomy
Session30(Week29)	Revision (questions answering and discussion).
Session 31 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiotherapy Planning

1	**Course name**	**Radiotherapy Planning**
2	**Course Code**	**RD405**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of Radiotherapy Planning and the fundamental components of treatment planning, who wish to deepen their knowledge of IMRT planning technique
Textbooks required for this Course:	• Murat Beyzadeoglu, Gokhan Ozyigit & Cuneyt Ebruli, Basic RadiationOncology, e-ISBN: 978-3-642-11666-7 • Practical Radiotherapy Planning By Ann Barrett, Stephen Morris, Jane Dobbs, Tom Roques 4th edition 2009 • Strategies for Radiation Therapy Treatment Planning 1st Edition by Ping Xia PhD,Andrew Godley PhD , Chirag Shah MD 2018 • Handbook of Treatment Planning in Radiation Oncology, 3rd Edition byVidetic, Gregory M. , Vassil, Andrew D., Woody, Neil M 2020 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials Class discussion, Practical Demonstrations
Course Objectives:	Up on completion of the course students should be able to: • Identify the types of simulators for radiological device. • Develop skills in producing an optimal 3 dimensional and IMRT dose distribution of breast, pelvic and head and neck region • Develop skills in Radiotherapy Physics treatment planning • Develop skills integrating Radiobiology in treatment planning. • • Evaluate the products as well as the process of preparation the treatment of these patients. • Develop skills in IGRT techniques. • Further develop communicative and co-operative skills.

	• Have insight into the role of the Radiotherapy-technician in relation to the organization of a Radiotherapy department in the Netherlands. • Produce an optimal 3 D dose distribution. • Produce an IMRT dose distribution • Argue the choices you made. • Be able to reflect on your products and your process • Familiar with special computer programs and radiotherapy plans • Understand methods of evaluating radiological treatment plans for patients with cancerous tumor.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1 & 2)	Principles of treatment planning
Session 2 (Week 3 & 4)	Methods of treatment by ionizing radiation
Session 3 (Week 5 & 6)	Radiotherapy Procedure
Session 4 (Week 7 & 8)	Radiotherapy simulation
Session 5 (Week 9 & 10)	CT Simulation
Session 6 (Week 11 & 12)	Cobalt-60 teletherapy unit (Co-60)
Session 7 (Week 13, 14, 15)	Linear Accelerator (Linac)
Session 8 (Week 16)	**Midterm exam**
Session 9 (Week 17)	Kilo-voltage X-ray therapy machine
Session 1 (Week18& 19)	X-ray Therapy Machine
Session 11 (Week 20)	Superficial x-ray radiotherapy
Session 12 (Week 21)	Ortho-voltage x-ray radiotherapy
Session 13 (Week 22)	Brachytherapy and External beam radiotherapy techniques
Session 14 (Week 23)	Patient positioning and immobilization
Session 15 (Week 24,25)	Immobilization systems and Beam Modifiers
Session 16 (Week 26)	Process of preparing focalized blocks
Session 17 (Week 27)	Matching of adjoining Fields
Session 18 (Week 28)	Methods of Field Separation and Guidelines for field matching
Session 19 (Week 29)	Revision (questions answering and discussion).
Session 22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Radiotherapy Techniques

1	**Course name**	**Radiotherapy Techniques**
2	**Course Code**	RD406
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course describes the modern techniques in radiotherapy including the use of equipment, selection and use of accessories and patient setup.
Textbooks required for this Course:	• Walter and Miller," A short Text book of Radiotherapy", 4th edition, Churchill Livingstone. • Principles and Practice of Modern Radiotherapy Techniques in Breast Cancer 2013th Edition by Ayfer Haydaroglu , Gokhan Ozyigit 2012 • Monte Carlo Techniques in Radiation Therapy by Joao Seco and Frank Verhaegen 1st edition 2013 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
Course Objectives:	At the end of the course the student should be able to: • Describe the modern techniques required for patient setup. • Protect the critical organs, minimize and deal with the radiation sickness. • Reproduce the same setup every session. • Follow up patient's condition during the radiation course.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction To Radiation Oncology
Session 2 (Week 2)	Cancer Definition and Different types of Cancers
Session 3 (Week 3)	The Beginning of Cancerous Growth
Session4 (Week 4)	Tumors (neoplasm)
Session 5 (Week 5)	Malignant versus Benign tumors
Session 6 (Week 6)	Why Cancer is potential dangerous
Session 7 (Week 7)	Cancer detection & diagnosis

Session 8 (Week 8)	Tumor grading and Tumor staging
Session 9 (Week 9)	Cancer causes
Session 0(Week 10)	Radiation Therapy Definition
Session11 Week 11)	Goal and team
Session12(Week12)	Mechanism of Action and Dose and Fractionation
Session13(Week13)	Effect of different types of cancer
Session14(Week14)	History of Radiation Therapy
Session15(Week15)	Basic Principles of Radiation Therapy
Session16(Week16)	**Midterm exam**
Session17(Week17)	Types and steps of Radiation Therapy
Session18(Week18)	Other Types of Radiation Therapy Radiotherapy Accidents
Session19(Wee19)	Radiation Therapy Definition
Session2 (Week 20)	Breast Cancer
Session21(Week21)	Radiotherapy for breast cancer
Session22(Week22)	Lung Cancer
Session23(Week23)	Central Nervous System Tumors
Session24(Week24)	Nasopharyngeal Cancer and CA Larynx
Session26(Week25)	Gastro intestinal system cancers
Session27(Week26)	Anal Cancer and Gynecology cancers
Session2 (Week 27)	Endometrial Cancer
Session30(Week28)	Prostate Cancer and Palliative Radiotherapy
Session30(Week29)	Revision (questions answering and discussion).
Session32(Week30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Digital Image Acquisition & Quality Management in Radiotherapy

1	**Course name**	**Digital Image & Quality Management in Radiotherapy**
2	**Course Code**	**RD407**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English language
9	**Date of course approval**	2022

Brief Description:	The course is designed to enable the students to outline, describe and discuss digital radiography, imaging acquisition, errors and soft image processing as well as different display modalities, In addition, the course will also discuss preventive analysis that can be done on any radiotherapy process
Textbooks required for this Course:	• Brennan P, Seeram E. *Digital Radiography.* Blackwell Publishing Professional, 2007ISBN 0632064714 • Quality and Safety in RadiotherapyEdited By Todd Pawlicki, Peter Dunscombe, Arno J. Mundt, Pierre Scalliet 1st edition 2020 • PODGORSAK, E.B., editor, Radiation Oncology Physics: A Handbook for Teachers and Students, 2005, Vienna (2005). • IPEM, Report 81: Physics aspects of quality control in radiotherapy, York (1999). • MUTIC, S., et al., Quality assurance for computed-tomography simulators and the • computed-tomography-simulation process: report of the AAPM Radiation Therapy Committee Task Group No. 66, Med Phys 30 10 (2003) 2762-92. • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials Class discussion, Practical Demonstrations

Course Objectives:	By the end of this course participants should be able to: • Know the basic rules of digital photograph • Knowing how to acquire a digital image and the errors that prevent its acquisition • Evaluate the digital image. • Display the image on a screen - or a movie • Understand the knowledge of the communication and archiving system (PACS) - Knowledge of the digital imaging and communication system (Digital Control (DICOM)) - Quality and maintenance methods • Understand the cause, frequency and effects of incidents/accidents in a radiotherapy department • Understand the principles of reactive management to incidents (registration, analysis and feed back to the Quality Management System) and of proactive management of safety (incident prevention) • Know how to communicate around radiotherapy incidents, with the patient and his/her relatives, within the department itself and with the media.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction
Session 2 (Week 2)	Digital image characteristics
Session 3 (Week 3)	Digital receptors
Session 4 (Week 4 & 5)	Comparison of detector properties and evaluative criteria
Session 5 (Week 6)	Cassette-based systems
Session 6 (Week 7)	Cassette-less systems
Session 7 (Week 8 & 9)	Strong dependence of image quality on
Session 8 (Week10& 11)	Dynamic range vs. film and exposure latitude
Session 9 (Week12&13)	Image Acquisition
Session10(Week14&15&16)	Image extraction – cassette-based system
Session 11 (Week 17)	**Midterm exam**
Session 12(Week 18&19)	Exposure indicator
Session 13 (Week20&21)	Image Acquisition Errors
Session 14(Week22&23)	Exposure field recognition
Session15Week 24)	Nyquist criterion Software (Default) Image Processing
Session16Week 25)	Effects of excessive processing
Session 17 (Week 26)	Display
Session 18(Week 27-28)	Revision (questions answering and discussion).
Session 19 (Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal

	communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospitals Practical Training II & Case Study

1	**Course name**	**Hospitals Practical Training II & Case Study**
2	**Course Code**	RD408
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Radiation Protection
7	**Program offered the course**	Medical Radiology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The Course is continuity to clinical practice (I). The course is designed to provide opportunities by which the students develop a level of integration between theoretical knowledge and skills radiographic techniques of actual patients within the radiological department.
Textbooks required for this Course:	• Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002. • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	6 * 28 = 168 teaching hours
Delivery	Problem based learning, Tutorials (office hours).Class discussion, Practical Demonstrations
Course Objectives	Up on completion of the course students shoude be : • perform radiographic procedures of the clinical practice I. • Able to perform the special examinations, tomography imaging (CT & MRI imaging), radiation protection, ethics and professional conducts. • Carrying out anatomical and functional examinations of nuclear medicine technology, which include examinations of bones - brain - thyroid gland - liver and spleen - kidneys - lungs, etc.

	• Acquire the skills of outlining, discussing, describing or using as well as writing reports about diagnostic procedures in medical imaging. • They will also enumerate such procedure of cases of special interest such as dealing with certain pathological findings.
Course Assessments	Clinical Practice 70%, Clinical Practice Record Book 20%. Activity 5 %, Attendance 5 %
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction
Session 2 (Week 2 & 3)	Upper limb Investigation
Session 3 (Week 4)	Shoulder Investigation
Session 4 (Week 5 & 6)	Lower limb Investigations Pelvic girdle Investigations
Session 5 (Week 7)	Chest Investigations
Session 6 (Week 8)	Abdomen Investigations
Session 7 (Week 9 &10)	Spine Investigations
Session 8 (Week 11& 12)	Skull (all skull positioning)
Session 9 (Week 13, 14 & 15)	Contrast Media Investigations
Session 10 (Week 16, 17)	Midterm exam and Mammography
Session 11 (Week 18)	Dental Radiography
Session 12(Week 19 & 20)	Angiography
Session 13 (Week 21 & 22)	Magnetic Resonance Imaging Applications
Session 14(Week 23 & 24,25)	CT scan Applications and Ultrasound Investigations
Session 15 (Week 26 & 27)	Radiotherapy Techniques
Session 16 (Week 28 & 29)	Nuclear Medicine Techniques
Session 17 (Start from the fourth week up to the end)	Case Study
Session 18 (Week30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

رابعا: المقررات الدراسية لقسم العلاج الطبيعي واعادة التأهيل

أ. المقررات الدراسية للسنة الثانية قسم العلاج الطبيعي واعادة التأهيل

Principle of Physiotherapy

1	**Course name**	**Principle of Physiotherapy**
2	**Course Code**	PT201
3	**Course type: /general/specialty/optional**	**specialty**
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is an introduction to the Definition & role of Physical therapy, Methods of Physical therapy, Characteristics of Physical Therapist, Physical Therapy department, Soft tissue manipulation, Manual massage, Isokinetic training, Electro diagnosis, Gait, Uses of computer in physiotherapy and in the end the evaluation of the patients.
Textbooks required for this Course:	• Tidy's physiotherapy, Churchill Livingstone, Stuart Porter, Fourteenth Edition 2011. • Principle of physical therapy, Peter G. Tsarfia, M.D, Grune Stratton. • Complete reflexology (therapeutic foot message for health and will-being), Mustard 1999 Designed by The Bridgewater book company. • Principles of Exercises in Physiotherapy by C Sivaram 2009, DOI 10.5005/jp/books/10675 • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation, practical.
Course Objectives:	• Upon completion of this course, the student will have reliably demonstrated the ability to: • Use and apply each principle of physical therapy individually or all with the priority of one principle over the other. • Apply the regulations and laws issued by the General Assembly of Physiotherapy in the same direction, the direction of the patient and the direction of the team • Apply the basic principles of physiotherapy towards the patient in practice. • Collect patient information and use it to plan for the patient.

	• Stop one starter and replace it with another when necessary. Dr. General and Transferred Skills
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
Content Breakdown Topical Coverage	Content Breakdown Topical Coverage
Session 1 (Week 1)	Definition & role of Physical therapy Methods of Physical therapy Characteristics of Physical Therapist Physical Therapy department Soft tissue manipulation
Session 2 (Week 2)	Manual massage: describe briefly the following: 1. History of massage. 2. Mechanical points to be considered. 3. Points to be considered while giving massage
Session 3 (Week 3)	Manipulations. The time of day for treatment. The comfort and support of the patient (draping, bolstering & positioning). Position of operator (therapist stance). Using body weight. Contact and continuity. Techniques, indications and contra – indications
Session 4 (Week 4)	Physiological effects of massage on various systems of body, effects on: Excretory system, circulatory system, muscular system, nervous system & metabolic system.
Session 5 (Week 5 & 6)	Define and describe the various manipulation techniques used in massage: Stoking manipulations: Effleurage, Stroking. Pressure manipulations: Kneading : Squeezing. Stationary, circular Ironing (reinforced kneading) Finger kneading, Petrissage (picking up, wringing, rolling), Frictions. Percussion manipulations : Tapotement, Hacking, Clapping, Beating & Pounding. Shaking manipulation : Vibration, Shaking.
Session 6 (Week 6 & 7)	. Massage for upper limb: Scapular region, Shoulder joint, Upper arm, Elbow joint, Forearm, Wrist joint and Hand.
Session 7 (Week 8)	Massage for lower limb: Thigh, Knee joint, Leg and Foot (including ankle joint and toes).
Session8 (Week 9& 10)	Massage for back: Neck and Upper back, Middle and Lower back, Gluteal region
Session 9(Week 11 & 12)	Massage for the face.
Session 10 (Week 13)	Connective tissue massage Define and describe the technique, effects & uses and contra-indications
Session 11 (Week 14)	**Midterm exam practical**
Session 12 (Week 15)	**Midterm Exam Theoretical**
Session 13 (Week 16)	Myofascial release: Define and describe the technique, effects & uses and contra-indications
Session 14 (Week 17)	Neural mobilization

	Define and describe the technique, effects & uses and contra-indications
Session 15 (Week 18)	Peripheral mobilization Define and describe the technique, effects & uses and contra-indications
Session 16 (Week 19)	Spray stretch technique Define and describe the technique, effects & uses and contra-indications
Session 17 (Week 20)	Gait Define and describe the technique, effects & uses and contra-indications
Session 18 (Week 21)	Uses of computer in physiotherapy Define and describe the technique, effects & uses and contra-indications
Session 19 (Week 22)	Newer techniques in message Define and describe the technique, effects & uses and contra-indications
Session 20 (Week 23)	Acupressure Define and describe the technique, effects & uses and contra-indications
Session 21 (Week 24)	Isokinetic training Define and describe the technique, effects & uses and contra-indications
Session 22 (Week 25)	Electro diagnosis Define and describe the technique, effects & uses and contra-indications
Session 23 (Week 26)	Specific uses of message Define and describe the technique, effects & uses and contra-indications
Session 24 (Week 27)	Reflexology Define and describe the technique, effects & uses and contra-indications
Session 25 (Week 28)	Biomechanics Define and describe the technique, effects & uses and contra-indications
Session 26 (Week 29)	Exercise in rehabilitation Define and describe the technique, effects & uses and contra-indications
Session 27 (Week 30)	Revision (Discussion and questions answering).
Session 28(Week 31)	**Final Exam practical**
Session 29 (Week 32)	**Final Exam Theoretical**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability:

	• Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain. • Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder)

	• Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color • Receptors and glands • Skin burns and disorders • Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is

	dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis. • The metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science.

	• The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Microbiology

1	**Course name**	General Microbiology
2	**Course Code**	MT203
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables students to know: * The microorganism and definition of all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells. *Methods and types sterilization and disinfectant. * Culturing and cultivation of Microorganisms and basic way of their identifications
Textbooks required for this Course:	• Text book of microbiology First Published in 2010 by Prem C. Bakliwal forAavishkar Publishers ISBN 978-81-7910-306-7. • https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf • https://open.umn.edu/opentextbooks/textbooks/873 • https://www.britannica.com/science/microbiology • https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/1%3A_Introduction_to_Microbiology • https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells. • Comprehend the fundamentals of molecular microbiology. • Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.

	• Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health. • Understand Microbial Cell Structure, Function and methabolism.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction, of microbiology
Session 2 (Week 2)	History of Microbiology
Session 2 (Week 3)	• Defining Microbes and Basic concepts and scope of microbiology
Session 3 (Week 4)	Pasteur and spontaneous Generation
Session 4 (Week 5 & 6)	Types of microorganisms
Session 5(Week 7,8)	Classification of microorganisms
Session6(Week 9)	Immunization, antiseptics and antibiotics
Session 7(Week 10)	Microscopy
Session 8(Week 11)	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
Session9(Week 12)	Bacterial structure& composition
Session10(Week 13)	Bacterial Genetics
Session11(Week 14 & 15)	Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
Session12(Week 16)	**Midterm exam**
Session13(Week 17)	Isolation and culturing of Bacteria
Session14(Week 18 & 19)	Microbial metabolism
Session15(Week 20)	Classification of bactria
Session16(Week 21)	Dyes and staining (gram stain, acid fast staining, and other staining metods).
Session17(Week22 & 23)	Fungi: 1. what is mycology? 2. Classification and structure 3. Moulds, yeasts and dimorphic fungus. Fungal diseases Algae: 4. Characteristics, structure and division of algae
Session18(Week 24 & 25,26)	Viruses 1. Definition, Characteristics, symmetry and structure of viruses, 2. Classification and growth of Viruses. 3. Detection, multiplication of Viruses. 4. Laboratory methods used for viral detection
Session19(Week 27,28)	Parasites 1. Definition, Characteristics and structure of parasites, 2. Summary of Parasitic Classification (Protozoa and Helminths). 3. Detection, multiplication of Protozoa and Helminths. 4. Laboratory methods used for viral detection
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Histology

1	**Course name**	Histology
2	**Course Code**	MT204
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Histology and Know the different types of tissues of the body Recognize the function performed by each tissue Learn about common terms and definitions used in histology
Textbooks required for this Course:	• DiFiore's atlasof histologywith functionalcorrelations. Junqueira'sBasic Histology. • Histology: An Essential Textbook by D. J. Lowrie Jr 2020 • Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021 • Textbook of Histology by Leslie P. Gartner PhD 2021 • Histology: A Text and Atlas 7th edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015 • Wheater's Functional Histology: A Text and Colour Atlas 3rd edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours

Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire a basic background in histology and comparative histology in different and to understand the properties of cells and their interactions with one another as components of tissues and organs. • Understand how structure and function correlate at the microscopic level and be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination. • Understandthe changes that occur to tissues • Identify the different types of tissues • Recognize the types of tissues and the mechanisms of identifying them • understand the various diagnostic tools and medical equipment in the correct way to discover histological changes • Understand how to distinguish tissue and how it develops • deduce the causes of the changes that have occurred within the tissues
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to histology •histology and its mode of study
Session 2 (Week 2)	• The cell
Session 3 (Week 3)	• Epithelial Tissue
Session 4 (Week 4)	• Connective tissue
Session 5 (Week 5)	• Cartilage
Session 6 (Week 6)	• Bone
Session 7 (Week 7)	• Bone.
Session 8 (Week 8)	Muscle Tissue
Session 9 (Week 9)	Nerve Tissue
Session 10 (Week 10)	•Nervous System
Session 11 (Week 11)	The Immune System &
Session 12(Week 12)	Lymphoid Organs
Session 13(Week 13	Blood and Hemopoiesis
Session 14 (Week 14)	Endocrine System
Session 15(Week 15)	Hormones
Session 16(Week 16)	The integumentary system
Session 17 (Week 17)	The Circulatory system
Session 18 (Week 18)	The Circulatory system
Session 19 (Week 19)	The Circulatory system
Session 20 (Week 20)	• Respiratory system
Session 21 (Week 21)	Respiratory system

Session 22 (Week 22)	Respiratory system
Session 23 (Week 23)	Digestive system
Session 24 (Week 24)	The urinary system
Session 25 (Week 25)	The urinary system
Session26(Week26- 27)	Reproductive system
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and

	relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪ ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle

	• Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Midterm exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex

Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney •Urine formation •Micturition •Renal failure •Male reproductive •Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland Parathyriod Adernal gland Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised..

Medical psychology& Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.

	• Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be famillar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell

Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.

	• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**

Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	This course introduces medical technology students to the field of medical ethics. The objective of the course is: • To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner • Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 %

	A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 3. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others; • Learn to select, use, and critically analyze current HCMN research and literature;

	• Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources

Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب - المقررات الدراسية للسنة الثالثة قسم العلاج الطبيعي وإعادة التأهيل

Testing and Measurement Methods

1	**Course name**	**Testing and Measurement Methods**
2	**Course Code**	**PT301**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Physiotherapy Prog>
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will include: basic of general patients evaluation \ types methods of patent evaluation \ general manual muscle testing of human muscular system\ general joints range of motion measurement \ Typical and neurological examinations of cervical and lumbar motor regions
Textbooks required for this Course:	• Tidy's physiotherapy, Churchill Livingstone, Fourteenth Edition 201, Stuart Porter. • Muscle Testing. Techniques of manual examination, W.B. Saunders Company, 6th Edition, Helen J. Hislop & Jacqueline Montagomery. • Measurement of joint motion, F.A. Davis Company, 4th Edition, Cynthia C. Norkin & D. Joyco White. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based presentation, group interaction and discussion, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand how to use the right way to make a general assessment and patient evaluation. • Do manual muscle testing for each muscle of the human body. • know the normality and abnormality of joints structures and know the normal range of motion of each joint and be able to test and measure all the joints of the human body. • Studying and knowing all the necessary tests for the stability of the motor areas of the body such as the neck area, the lumbar spine area, the knee and the shoulders. • Identify the problem, disease or disorder the patient has construct a series of outcome measures and therapeutic plan • Write well developed case report • Respect the patient's privacy and preserve confidentiality.

Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to testing and measurement methods
Session 2 (Week 2 & 3)	**General criteria for patient evaluation** .Describe the general patient evaluation List the factors that may contribute to restricting human movement and normal motion. Diseases
Session 3 (Week 4-12)	Manual muscle tests Cervical grubs manual muscle testing Back and abdomen grubs manual muscle testing Respiratory, chest and diaphragm testing. Upper limbs manual muscle testing Lower limbs manual muscle testing
Session 4 (Week 13)	**Midterm practical Exam**
Session 5 (Week 14)	**Midterm Exam theoretical**
Session 6 (Week 15-17)	Cervical spine ROM measurement
Session 7 (Week 18-22)	Lumbar spine ROM measurement
Session 8 (Week 23-25)	Upper limbs ROM measurement
Session 9(Week25-26)	Lower limbs ROM measurement
Session 10(Week 27)	Management of cerebral palsy
Session 11(Week 28)	Normal & abnormal functional ability of each motor joint.
Session 12(Week 28)	Revision and discussion
Session 13(Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pediatrics and physiotherapy

1	**Course name**	**Pediatrics and physiotherapy**
2	**Course Code**	PT302
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will include: typical development milestone, reflex maturation, assessment and therapeutic interventions of selected most common medical conditions which normally referred to physiotherapy. Such as cerebral palsy, erb's palsy, spina bifida, club foot, developmental dysplasia of hip etc.
Textbooks required for this Course:	• Essential paediatrics by David Hull / Derek Johnston 4th Edition or later. • Pediatric Rehabilitation (Principles and Practice) by Michael Alexander / Dennis Matthews. Fourth Edition (or later) • Therapeutic Exercise, foundations and techniques by Carolyn Kisner / Lynn Colby 6th Edition • Journal of Physical Therapy and Pediatric Physical therapy • http://www.actionsportphysio.com/en/services/treatments/physiotherapy-pediatric-approach/ • http://www.beh-mht.nhs.uk/enfield-community-services/ecs-services/paediatric-physiotherapy.htm • http://apcp.csp.org.uk/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based presentation, group interaction and discussion, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand normal developmental milestone • Identify the problem, disease or disorder the patient has • Recognize the motor and/or functional needs of each case • Construct a series of outcome measures and therapeutic plan • Write well developed case report

	• Respect the patient's privacy and preserve confidentiality
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1 & 2)	1. Describe **growth and development** of a child from birth to 12 years: including physical, social, adaptive development. 2. List **the maternal and neonatal factors contributing to high risk pregnancy**. The neonatal inherited diseases; maternal infections - viral and bacterial; maternal diseases incidental to pregnancy, such as gestational diabetes, pregnancy induced hypertension; chronic maternal diseases such as heart diseases, renal failure, tuber-culosis, diabetes, epilepsy; bleeding in the mother at any trimester. 3. Briefly describe **community programmes: International (WHO) national and local**, for prevention of poliomyelitis, blindness, deafness, mental retardation and hypothyroidism, Outline the immunization schedule for children.
Session 2 (Week 3, 4 & 5)	**Reflex maturation testing** 1. Spinal and brain stem reflexes (primitive reflexes). 2. Midbrain level (Righting reactions). 3. Cortical level (Equilibrium and protective reactions). Training on who to practice the above reflex maturation testing
Session 3 (Week 6,7,8 &9)	**Cerebral palsy** 1. Define and briefly outline etiology prenatal and post natal causes. 2. Briefly mention pathogenesis. 3. Classification of cerebral palsy. 4. Associated problems. 5. Physical therapy Assessment of cerebral palsy. a. Assessment of movement. b. Assessment of postural control. c. Assessment of postural tone. d. Musculoskeletal assessment. e. Assessment of gross & fine motor skills. f. Evaluation of gait. 6. Describe Physiotherapy management of cerebral palsy. a. Functional ability. b. Muscle testing. c. ROM testing. 7. Briefly describe medical treatment. 8. Describe Physical therapy treatment. a. Handling technique b. Prevent deformity. c. Prolonging ambulation. d. Wheelchair use. e. Orthoses. f. Weight control. g. Minimizing spinal deformity. h. Activities of daily living. i. Facilitation of family support.

	j. Facilitating sleep. k. Management of pain. l. home exercises 9. Occupational therapy
Session 4 (Week 10,11)	**Erb's palsy** 1. Define and outline the etiology. 2. Risk factors 3. Associated problems. 4. Physical therapy assessment. a. Informal assessment. b. Muscle tone assessment. c. Muscle test: manual muscle test & functional muscle test (before 3 years of age). d. ROM test. e. Test of tightness. f. Long & Round measurement. g. Fine motor development test. 5. Describe Physical therapy management. a. Handling technique b. Strengthening exercises c. ROM exercises d. Electrotherapy e. constraint induced therapy f. parent education g. home exercises 6. Occupational therapy
Session 5 (Week 12 & 13)	**Congenital muscular torticolis** 1. Define and outline etiology. 2. Associated problems. 3. Physical therapy assessment. a. History. b. Informal evaluation. c. ROM test. 4. Describe Conservative management (physical therapy treatment). 5. Briefly outline surgical management. 6. Physical therapy for post-operative cases. a. Handling technique b. Strengthening exercises c. ROM exercises d. Parent education g. Home exercises
Session 6 (Week 14)	**Midterm Exam**
Session 7 (Week 15 16& 17)	**Club foot deformity** 1. Define and outline etiology. 2. Physical therapy assessment. a. Informal evaluation. b. ROM test.

	c. Muscle test: manual muscle test & functional muscle test. d. Developmental test. e. Long and Round measurements. 3. Describe Physical therapy treatment. a. Reflex activities b. Strengthening exercises c. ROM exercises d. Electrotherapy e. Parent education F. Home exercise program g. Casting, splinting and orthosis 4. Briefly outline surgical treatment. 5. Physical therapy for post-operative cases. a. Strengthening exercises b. ROM exercises c. Electrotherapy d. Parent education e. Home exercise program f. Orthosis
Session 8(Week 18,19, 20)	**Developmental dysplasia of the hip** 1. Define and outline etiology and incidences of DDH. 2. Classification: subluxation, dislocatable and dislocated. 3. Clinical presentation 4. Physical therapy assessment. a. Ortolani test. b. Barlow' test. c. Range of Motion d. Gait analysis - Unilateral DDH: Trendelenberg gait. - Bilateral DDH: Waddling gait. 5. Describe Physical therapy management of DDH. a. Strengthening exercises b. ROM exercises c. Electrotherapy d. Parent education e. Home exercise program f. Orthosis g. Gait training
Session 9(Week 21, 22, 23)	**Spina bifida** 1. Define Spina bifida and outline etiology. 2. Outline developmental difficulties and complications. 3. Define Hydrocephalus & the chiari II malformation and outline etiology. 4. Outline symptoms associated with chiari II malformation. 5. Briefly describe surgical management of hydrocephalus: ventriculoatrial (VA) shunt & ventriculoperitoneal (VP) shunt. 6. Physical therapy assessment for infant with Spina bifida.

	a. Muscle test: manual muscle testing & functional muscle testing. b. ROM test. 7. Describe Post-operative physical therapy program.
Session 10 (Week 24,25,26)	**Muscular dystrophy** A. **Myotonic dystrophy and Facioscapulohumeral dystrophy**: 1. Define and outline etiology. 2. Outline modes of inheritance and clinical manifestation. 3. Outline physical findings in relation to disabilities progression and prognosis. 4. Describe Physical therapy evaluation. a. Functional ability. b. Muscle testing. c. ROM testing. 5. Briefly describe medical treatment. 6. Describe Physical therapy treatment. a. Maximize physical potential b. Maximize respiratory function c. prevent soft tissue shortening d. maximize motor development and milestone e. maintains muscle strength f. improve postural stability g. improve independency h. improve quality of life B. **Duchene muscular dystrophy** 1. Define and outline etiology. 2. Outline modes of inheritance and clinical manifestation. 3. Outline physical findings in relation to disabilities progression and prognosis. 4. Describe Physical therapy evaluation. a. Functional ability. b. Muscle testing. c. ROM testing. 5. Briefly describe medical treatment. 6. Describe Physical therapy treatment. a. Prevent deformity. b. Prolonging ambulation. c. Wheelchair use. d. Orthoses. e. Weight control. f. Minimizing spinal deformity. g. Respiratory consideration. h. Activities of daily living. I. Facilitation of family support. j. Facilitating sleep. k. Management of pain.
Session 11 (Week 27 & 28)	**Down's syndrome** 1. Define and outline etiology.

	2. Pathophysiology 3. Signs and symptoms 4. Associated impairments: neuropathology, sensory deficits, cardiopulmonary pathologies, musculoskeletal differences & additional physical characteristics. 5. Physical therapy treatment of D.S a. Balance training b. strengthening exercises c. activities of daily livings d. facilitate family support
Session 12 (Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Surgery & Physiotherapy

1	**Course name**	**General Surgery & Physiotherapy**
2	**Course Code**	**PT303**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will contain to section first the Inflamation and infection, common surgical problems, ulcers, shock, burns and management,	

	general surgery and gastro-intestinal disease, describe abdominal surgical incisions, post- operative complications and management, vascular surgery, pulmonary collapse, post- operative fluid and electrolyte imbalance, urological and cathetirization. second, the physiotherapy and general surgery burns surgery mastectomy anal and perianal disorders haemorrhoids. Define the following and describe their causes and management of conservative and surgical treatment. Describe physical therapy program for anal & perianal disorders including: pelvic floor exercises, abdominal exercises, biofeedback and electrical modalities.
Textbooks required for this Course:	• Tidy's physiotherapy, Churchill Livingstone, Stuart Porter, Fourteenth Edition 2011. • surgury &icu, Text book • http:www.who.int/emergencyburn cases/pht/ent • http://www.icmr.nic /ijmr.com • Textbook of Physiotherapy in Surgical Conditions by Mitra P.K.2013 DOI 10.5005/jp/books/11812 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation, practical.
Course Objectives:	Up on compleltion of the course students should be able to: • Know the type of surgery and the name of the injured muscle for each surgery and ways to strengthen it, • Know the type of burn and his physiotherapy, • Distinguish the right conditions and angles for each case, • Diagnose the type of exercises for each case, that the student led to determine the appropriate device to relieve the pain for each case depending on the location and type of injury • Understand the effects of traumas and surgical interventions, as well as their treatment principles and the formation mechanisms of different of injuries, diagnostic procedures, major lines of treatments. • Know the potential complications,prognosis of the injuries, • Have detailed knowledge on the post-operative, post-traumatic rehabilitation options and general methods for the different injury types.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Inflammation and infection: a. Inflammation. b. Wounds and Wound healing. c. Traumatic wounds. d. Soft-Tissue infection. e. Abscess and cellulitis.
Session 2 (Week 2)	Common surgical problems: a. Tumors. b. Cysts.
Session 3 (Week 3)	ULCERS:

	a. Sinus and Fistulas. b. Gangrene
Session 4 (Week 4)	Shock: Definition, Types, etiology and Management.
Session 5 (Week 5)	Burns and management a. Classification of burns. b. Medical management of burns. c. Deformities due to burns. d. Prevention and treatment measures. e. Burns rehabilitation.
Session 6 (Week 6)	General surgery and gastro-intestinal disease: a. Acute Intestinal Obstruction. b. Nephrectomy, Appendicectomy, Herniorraphy, Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
Session 7 (Week 7)	Describe abdominal surgical incisions
Session 8 (Week 8)	Post- operative complications and management OF: Nephrectomy, Appendicectomy, Herniorraphy Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
Session 9 (Week 9)	Vascular surgery: a. Varicose veins. b. The post phlebetic limb. c. Amputations. d. Deep Vein Thrombosis.
Session 10 (Week 10)	Pulmonary Collapse: a. Pulmonary embolus. b. Burst abdomen. c. Post- operative fistula. d. Post- operative pyrexia.
Session 11 (Week 11)	Post- operative fluid and electrolyte imbalance
Session 12 (Week 12)	Urological: Renal colic.
Session 14 (Week 13)	a. Circumcision. b. Haematuria
(Week 14)	**Midterm Exam**
Session 15 (Week 15)	Physiotherapy and general surgery BURNS Describe the anatomy and physiology of skin. Describe burn wound evaluation form including: date of physical therapy visit , date of burn injury, date of hospital administration, history, Rule of nines, Lund & Browder chart, vital signs, assessment of pain, oedema, ROM, muscle test, functional activity, gait, hypertrophic scar, wound surface and wound volume. Classify burns by depth and surface area, outline the causes, medical management and precautions in the acute stage.
Session 16 (Week 16)	Describe the effect of burn on body systems including: cardiovascular system, respiratory system, renal system and immune system. Describe the phases of wound healing, wound contracture & contraction and factors affecting wound healing. Describe the approaches to positioning the burn patient: adult and pediatric positioning.
Session 17 (Week 17)	Describe types of splints, their indications, uses, advantages and disadvantages.
Session 18 (Week 18)	List the potential deformities due to burns, methods of prevention and precautions. Mention cosmetic and functional treatment measures.
Session 19 (Week 19)	Outline the plastic surgery procedures and physiotherapy management in rehabilitation of burns, including splinting methods for common deformities and prevention of burns contractures.
Session 20 (Week 20)	Describe burn patient exercise program including: goals, factors affecting the establishment of exercise program, precautions, contraindications and types of exercise (ROM exercises, conditioning

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	exercises, functional exercises and joint mobilization, in addition to specific exercises to specific areas).
Session 21 (Week 21)	Define scar hypertrophy and list its characteristics & possible causes and describe its assessment and treatment.
Session 22 (Week 22)	Describe assessment and management of lower extremity burns and ambulation. Describe physical therapy agents used in burn care and their physiological effects including use of the following: ultrasound, hydrotherapy, paraffin, hot packs, cryotherapy and laser, TENS, NMES, EMG biofeedback and microcurrent (MENS), continuous passive motion (CPM), intermittent vasopneumatic compression, massage and hyperbaric oxygen therapy (HBOT).
Session 23 (Week 23)	Surgery: Assess the patients: medical history, past treatment, breathing pattern, ability to cough and pain. Identify problem: pain, increased secretions, defective posture and decreased exercise tolerance.
Session 24 (Week 24)	Demonstrate treatment techniques: Breathing exercise, huffing and coughing, mobilizing exercise, postural drainage, posture correction and graduated exercise program. Describe abdominal surgical incisions. Outline the post- operative complications and physiotherapy management of Nephrectomy, Appendicectomy, Herniorraphy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
Session 25 (Week 25)	Mastectomy - Define mastectomy - Describe its types (radical, modified radical and simple mastectomy). - Describe the clinical problems of post mastectomy patient. - Describe physical therapy evaluation. - Describe physical therapy treatment.
Session 26 (Week 26)	Anal and perianal disorders I. Haemorrhoids. - Define and outline etiology, symptoms, classification and types. - Describe management of haemorrhoids including: conservative treatment & surgical treatment.
Session 27 (Week 27,28)	Define the following and describe their causes and management including: conservative and surgical treatment. -Anal fissure, Anal haematoma, Anorectal abscesses and anal fistula. Rectal prolapse, anal warts (codyloma acuminate) Describe physical therapy program for anal & perianal disorders including: pelvic floor exercises, abdominal exercises, biofeedback and electrical modalities.
(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy

	and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Therapeutic Exercise

1	**Course name**	**Therapeutic Exercise**
2	**Course Code**	**PT304**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Physiotherapy
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Theories and application methods of comprehensive therapeutic treatment and rehabilitation programs for injuries commonly sustained by the physically active.
Textbooks required for this Course:	• Hall and Brody, Therapeutic Exercise Moving Toward Function, 3rd ed. Philadelphia, Pa: Lippincott Williams and• Wilkins, 2011. Bandy and Sanders, Therapeutic Exercise, 3rd ed. Philadelphia, Pa: • Lippincott Williams and Wilkins, 2013. • Therapeutic Exercise: Foundations and Techniques • 7th Edition by Carolyn Kisner, Lynn Allen Colby, John Borstad 2018 • O'Sullivan, Schmitz, Fulk, Physical Rehabilitation, 6• th ed. Philadelphia, Pa: F.A. Davis Company, 2014. • Pruitt, R. Therapeutic Exercise Home Programs. • Kisner and Colby, Therapeutic Exercise Foundations and Techniques, 6th ed. Philadelphia, Pa: FA Davis, 2012. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based presentation, group interaction and discussion, and active participation.
Course Objectives:	Up on completion of the course students should be able to:

	• Define the role of the physical therapist assistant in the provision of therapeutic exercise. • Understand the role of therapeutic exercise as related to achievement of the goals in the plan of care. • List indications, precautions, contraindications and expected outcomes of therapeutic exercise. • Identify the physiological effects of exercise on the muscular, cardiovascular-pulmonary neurologic and other systems of the human body for all ages. • Identify incremental stages for exercise progression within the established plan of care. • Discuss institutional safety policies and procedures in the work environment as related to patient/client • Demonstrate techniques of therapeutic exercise and functional training Intervention
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1 & 2)	Demonstrate competence in the application of therapeutic exercise for the following: a) Aerobic Capacity/Endurance Conditioning or reconditioning I. Increase workload over time II. Movement efficiency and energy conservation training III. Walking/wheelchair propulsion programs
Session 2 (Week 3, 4 & 5)	) Balance, coordination and agility training. I. Developmental activities training II. Neuromuscular education or reeducation III. Postural awareness training IV. Standardized, programmatic, complementary exercise approaches (protocols)
Session 3 (Week 6,7,8 &9)	c) Body mechanics and postural stabilization I. Body mechanics training II. Postural stabilization activities III. Postural awareness training
Session 4 (Week 10,11 & 12)	d) Flexibility exercises I. Range of motion II. Stretching (eg. Passive, Active, Mechanical)
Session 5 (Week 13 & 14)	e) Gait and locomotion training I. Developmental activities training II. Gait training (with and without devices) III. Standardized, programmatic complementary exercise approaches IV. Wheelchair propulsion and safety
Session 6 (Week 15)	**Midterm Exam**
Session 7 (Week 16 17& 18)	f) Neuromotor development training I. Developmental activities training II. Movement pattern training III. Neuromuscular education or reeducation 4. Briefly outline surgical treatment. 5. Physical therapy for post-operative cases. a. Strengthening exercises b. ROM exercises c. Electrotherapy d. Parent education e. Home exercise program

	f. Orthosis
Session 8 (Week 19 20& 21)	F. relaxation Define and describe types & techniques of relaxation. G. Relaxed passive movement Describe classification, principles, indications, goals, limitations, contraindications, precautions and technique of application of passive movement. H. Stretching Describe types and Demonstrate passive stretching of following muscles / muscle groups and describe the indications, contra - indications physiological effects, advantages and disadvantages of each. Upper limb: pectoralis major, biceps brachii, triceps brachii, long flexors of the fingers.
Session 9 (Week 22, 23& 24)	M. neuromuscular coordination 1. Define Coordination and Incoordination. 2. Describe the following : a. Nervous Control. b. Causes of Incoordination. c. Coordination Tests. d. Re – education (principles of reeducation). e. Frenkel's Exercise.
Session 10 (Week 25,26, &27)	N. gait Define gait and describe the following : a. Gait Cycle (phases of gait cycle and stair gait cycle). b. Gait parameters and determinants of gait. c. Kinetics and Kinematics of the trunk & upper extremities. d. Gait deviations or abnormal gaits (pathological gaits). e. Gait training. O. MOBILITY AIDS 1. Wheel Chair : define wheel chair and describe the following: a. Types of wheelchairs. b. Considerations for the prescription of appropriate wheelchair. c. Parts of wheelchair. d. Clinical assessment for the prescription of wheelchair. e. Training to use the wheelchair. f. Wheelchair transfers. g. Powered wheelchair. 2. Walking Aids : define walking aids and describe the following: a. Crutches : describe the types, measurements, precautions, indications and uses. b. Preparation for crutch walking. c. Crutch walking. d. Sticks and Frames (measurement, types and method). e. Parallel Bar (structure, types and measurement).
Session 11 (Week 28 & 29)	P. ORTHOSIS Define Orthosis and describe the following : a. Functional and Regional Classification of Orthosis.

	b. Orthotic Prescription & Management. c. Role of physiotherapist in Orthotic management. d. Physical assessment for the prescription of Orthosis. e. Materials used in the Fabrication of Orthosis. f. Principles of Orthosis. g. Disadvantages of Orthosis. h. Indications for upper and lower limb Orthosis. i. Indications for the prescription of spinal Orthosis. j. Different Types of Spinal Orthosis. Q. RE-Education of muscle 1. Describe the following in re-education of muscle: The term re-education of muscle, Technique, Spatial summation, Temporal summation. 2. Demonstrate the various re-education techniques and facilitating method on various groups of muscles. 3. Demonstrate the progressive exercises in strengthening using various applications: (according to their muscle power) Grade 1 - Grade 5.
Session 12 (Week30-32)	**Assessment 4: Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Investigation

1	**Course name**	**Medical Investigation**
2	**Course Code**	**PT305**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of medical investigations: laboratory, radiological, electrical, Group of investigations advised by the treating doctor to get diagnosis and treatment of the disease. As will as diagnostic test refers to the various methods used to assess body structures and function to determine the presence or absence of a definite disease and nature of the disease if present.
Textbooks required for this Course:	• McPhee, S. J., Papadakis, M. A., & Rabow, M. W. (2014). Current medical diagnosis & treatment 2014. 53rd ed. New York: McGraw-Hill Medical • Differential diagnosis and medical therapeutics:a treatise on clinical by rao,psrk – 2011 • EKG | ECG Interpretation Made Easy: An Illustrated Study Guide For Students To Easily Learn How To Read & Interpret ECG Strips • Interpreting ECGs: A Practical Approach Paperback • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, hospital training....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand various types of medical investigations • Identify type of device used for the health problem • Recognize the status of the patient • Identify representations, terms, conditions, and clinical examination. • Recognize different type of disease • Construct good information about medical device • Write clinical examination for health problem

	• Develop thestudent skills to choose appropriate patient examination • Implement some medical investigation at hospital • Determine any abnormality. • Understand how to follow up the cases. • Help the physician [DR] in diagnosis and treatment.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to medical investigation • Types of medical investigation
Session 2 (Week 2)	• Aims of medical investigation
Session 3 (Week 3)	• Classification of medical investigation • Diagnostic test
Session 4 (Week 4)	• Laboratory investigation
Session 5 (Week 5)	• Urinalysis
Session 6 (Week 6)	• Methods of collecting urine
Session 7 (Week 7)	• Blood investigation
Session 7 (Week 8)	• Complete blood count, erythrocyte sedimentation rate
Session 7 (Week 9)	• The chemistry panel , blood glucose , FBS indicate
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	• uric acid test, creatinine test, electrolyte test
Session 12 (Week 12)	• liver function test
Session 13 (Week 13)	• blood test
Session 14 (Week 14)	• blood gases test
Session 15 (Week 15)	• cardiovascular system, heart function
Session 16 (Week 16)	• Types of cardiovascular disease and reducing the risk for cv disease
Session 17(Week 17,18)	Cardiovascular disorders) and Cytology.
Session 18(Week 19)	Medical investigation of gastrointestinal system.
Session 19(Week 20,21)	Medical investigation of urinary system disorder.
Session 20 (Week 22)	Medical investigation of respiratory system.
Session 21 (Week23,24)	- Medical investigation of central nervous system.
Session 22 (Week25)	Medical investigation of cardiovascular system.
Session 23 (Week26)	Medical investigation of bone diseases
Session 24 (Week27)	Medical imaging.
Session 25 (Week28)	Revision and discussion
Session 26 (Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing

	needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pharmacology

1	**Course name**	**Pharmacology**
2	**Course Code**	**MT306**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide how a drug affects a biological system and how the body responds to the drug. The discipline encompasses the sources, chemical properties, biological effects and therapeutic uses of drugs.
Textbooks required for this Course:	• Essential of general pharmacology book.Lippincott's Illustrated Reviews: pharmacology book.Pharmacology and drug administration for imaging technology book. • Basic Pharmacology Understanding Drug Actions and Reactions By Maria A. Hernandez,., Appu Rathinavelu, 1st edition 2006. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor. • A Textbook of Clinical Pharmacology and Therapeutics, 5th By James Ritter, Lionel Lewis, Timothy Mant, Albert Ferro 2008 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based.Group interaction and discussion. self-directed activities. Active participation.

Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire new knowledge in pharmacology by conducting and promoting innovative research. • Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs. • Report the clinical applications, side effects of drugs used in medicine. • Translate pharmacological principles into clinical decision making.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	A. General pharmacology: • Introduction. • Drug sources. • Routes of drug administration. • Pharmacokinetics.
Session 2 (Week 2)	A. General pharmacology: • Pharmacodynamics. • Drug adverse effects and toxicity. • Drug-drug interactions.
Session 3 (Week3)	B. Autonomic nervous system: • Introduction. • Sympathomimetics. • Sympathetic depressants.
Session 4 (Week4)	B. Autonomic nervous system: • Parasympathomimetics. • Parasympathetics depressants.
Session 5 (Week5)	B. Autonomic nervous system: • Drug acting on autonomic ganglia. • Skeletal muscle relaxants. • Drug acting on the eye.
Session 6 (Week 6	C. Autacoids: • Histamine & serotonine. • Prostaglandins & eicosanoids. • Vasoactive peptides.
Session7 (Week 7)	D. Central nervous system: • Introduction. • Sedative & hypnotics.
Session8 (Week 8)	D. Central nervous system: • Analgesics and antipyretics & NSAID. • Narcotic analgesics. • Anticonvulsants & antiepileptics
Session9 (Week 9)	D. Central nervous system: • Antiparkinsonian drugs. • Antipsychotics and antianxiety & antidepressants. • Local & general Anaesthetic.

Session10 (Week 10)	E. Cardiovascular system: • Antihypertensive & antishock drugs. • Cardiac glycosides and congestive heart failure. • Antiarhythemic drugs. • Drugs used in angina pectoris.
Session 11 (Week 11)	Topics to be covered in the session (week12) F. Blood: 1. Coagulants, anticoagulants, fibrinolytics & antiplatelets. 2. Drugs used in treatment of anemia. 3. Drugs used in treatment of hyperlipidemia.
Session 12(Week 12)	G. Chemotherapy: • Sulphonamides & quinolones. • B-lactum antibiotics (penicilins, cephalosporins).
Session 13 (Week 13)	G. Chemotherapy: • Chloramphenicol & tetracyclines. • Aminoglucosides antibiotics. • Antifungal drugs
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	G. Chemotherapy: Antiviral drugs, Antituberculus, Antimalarial drugs & antiprotozal.
Session 16 (Week 16)	H. Endocrie drugs: Antidiabetics drugs and Antithyroid drugs.
Session17 (Week 17)	H. Endocrie drugs: • Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).
Session 18 (Week 18)	H. Endocrie drugs: • Corticosteroids. • Sex hormones, contraceptives drugs.
Session 19 (Week 19)	I. Respiratory system: • Drugs used in treatment of bronchial asthma.
Session 20 (Week 20)	I. Respiratory system: • Cough therapy. * Gas therapy
Session 21(Week 21)	J. GIT: • Drugs used in treatment of peptic ulcer • Antiemetic drugs.
Session22(Week22-23)	J. GIT: • Drugs used in treatment of constipation and diarrhea. • Antispasmodics.
Session23(Week23-28)	K. Urinary tract: 1. Diuretics. 2. Urinary tract infection.
Session24(Week29)	Revision and discussion
Session25(Week 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to

	ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospital Practical Training -I

1	**Course name**	**Hospital Practical Training I**
2	**Course Code**	**PT307**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	None
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will include: basic of general clinical and hospital training, real practical patient's evaluation \identify and know the treatment units of the Physiotherapy Department/ apply types of the orthopedic and neuro evaluation tests to the real patients \ apply the treatment plan to ward indusial patient\ The ability to follow up on the patient, modifying and stopping the treatment plan according to the patient's condition.
Textbooks required for this Course:	• Therapeutic Exercise_ Foundations and Techniques (2012) • Tidy's physiotherapy, Churchill Livingstone, Fourteenth Edition 201, Stuart Porter. • Muscle Testing. Techniques of manual examination, W.B. Saunders Company, 6th Edition, Helen J. Hislop& Jacqueline Montagomery. • Measurement of joint motion, F.A. Davis Company, 4th Edition, Cynthia C. Norkin& D. Joyco White. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Real practice– case study-based presentation, group interaction and discussion, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand how to use the right way to make a general assessment and patient evaluation. • Apply the treatment plan to the real patients

	• Stand on the right way from any problem that buts the patient in the risk. • Identify the problem, disease or disorder the patient has. • Construct a series of outcome measures and therapeutic plan • Write well developed case report • Respect the patient's privacy and preserve confidentiality.
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities60 % Final Exam A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1& 2)	Stand on the mean units of the physiotherapy department
Session 2 (Week 3)	Describe the general patient practice dealing
Session 3 (Week 4)	Describe and apply of the general patient practice evaluation
Session 4(Week 5, 6)	Describe how to apply **the general patient practice treatment plan described to the patient**
Session 5 (Week 7, 8)	Therapeutic exercise given to low back pain, cervical disc
Session 6 (Week 9, 10)	Pain, core exercise and general exercise for pelvic
Session7(Week 11, 12)	Therapeutic exercise for upper limb (shoulder, elbow, wrist and fingers and metacarpal phalanges joints
Session8(Week12,13,14)	Therapeutic exercise for lower limb (hip, knee and ankle joints
Session 9 (Week 15,16)	passive exercise
Session 10 (Week17,18)	Active and strengthen exercise
Session11(Week19,20)	Stretching exercise
Session12(Week21,22,23 &24)	Electrotherapy unit
Session13(Week 25, 26)	Thermotherapy unit
Session14(Week 27, 28)	Revision, report writing and discussion
Session15(Week 29, 30)	**Final practical exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of

	changes to students as soon as possible. Timetable may also be revised.

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers.

	• Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications. • http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem

	• Statement of a Problem • Delimiting a Problem • Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study

Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling • Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pathology

1	**Course name**	**Pathology**
2	**Course Code**	MT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences, plus investigation of those pathological mechanisms common to all tissue-cell pathology. Attention is paid to the processes of cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Robbins & Cotran Pathologic Basis of Disease (Robbins Pathology) 10th Edition by Vinay Kumar MBBS MD FRCPath Abul K. Abbas MBBS , Jon C. Aster MD PhD 2020 • Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744. • Textbook of pathology by Harsh Mohan 6th edition, ISBN: 978-81-8448-702-2, 2010. • https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the common terms and definitions used in pathology • Identify of the nature of the disease, including its causes, growth patterns, and consequences

	• Recognizethe biological characteristics that distinguish each disease from the other. • The ability to distinguish the origin of the disease and how it develops The ability to distinguish the origin of the disease and how it develops •That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment •The student will infer the causes of disease and its growth patterns •The student determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Pathology gives explanations of a disease by studying the following four aspects of the disease 1. Aetiology 2. Pathogenesis 3. Morphologic changes 4. Functional derangements and clinical significance •The causes of disease Environmental factors Genetic Factors
Session 2 (Week 2)	**Cell injury.** - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury (Reversible & Irreversible cell injury).
Session 3 (Week 3)	**Cell injury.** - Free radicals (sources, effects & destruction of FR). - Cell injury by chemicals and Cell injury by viruses.
Session 4(Week 4)	**Cell injury.** - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
Session 5 (Week 5)	• **Inflammation .** a. Acute inflammation & its types.
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	• **Repair and healing**.
Session 8 (Week 8)	• **Infectious diseases**. a. Bacterial, Viral, Fungal and Parasitic infection - a general outline b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis & Hydatid disease.
Session 9 (Week 9)	•**Immunopathology**. 1. Immune mechanism of tissue injury: a. Type I hypersensitivity. b. Type II hypersensitivity. c. Type III hypersensitivity. d. Type IV hypersensitivity.

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	e. Tissue transplantation.
Session 10 (Week 10)	2. Autoimmune diseases: a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis. c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
Session 11(Week 11)	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
Session 12(Week 12)	• **Nutrition disorder.** Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• **Ionizing radiation.** a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• **Hemodynamic disorders** Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	**GENETIC DISORDERS** a. Single - Gene Defect "Mendalian Disorders" b. Disorders with Multifactorial Inheritance
Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• **Neoplasia.** - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	**Respiratory diseases.** Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	**Cardiovascular diseases .** - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28)	**Revision and discussion**
Session 22(Week29 - 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج. المقررات الدراسية للسنة الرابعة قسم العلاج الطبيعي وإعادة التأهيل

Gynecology-obstetric and physiotherapy

1	Course name	**Gynecology-obstetric and physiotherapy**
2	Course Code	PT401
3	Course type: /general/specialty/optional	specialty
4	Accredited units	3 units
5	Educational hours	4 hours per week
6	Pre-requisite requirements	Non
7	Program offered the course	Physiotherapy Prog.
8	Instruction Language	English
9	Date of course approval	2022

Brief Description:	This course will provide students with a fundamental understanding of the anatomy of the normal female pelvic, female genital tract and lower urinary tract and they will deal with diseases as urinary incontinence, genital prolapse displacement of the uterus. Students will practice of basic exercises for gynecology and obstetrics as breathing exercises, pelvic floor exercises, posture correction, leg exercises, arm exercises, circulatory exercises and postpartum exercises especially after normal labour and cesarean section to help improving and prevent any complications. the electrical modalities will use to relief any joint pain during pregnancy as TNES and increases joint mobility due to analgesic effects.
Textbooks required for this Course:	• Physiotherapy in obstetrics by Maria Ebner third edition 1967. • Physiotherapy in Obstetrics and Gynaecology (Including Education for Childbirth) Helen Heardman 1951 • Physiotherapy in Obstetrics and Gynaecology Second Edition by Jill Mantle, Jeanette Haslam and Sue Barton 2004 • Textbook of Physiotherapy for Obstetric and Gynecological Conditions by GB Madhuri 2007 • Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, practicing exercises.
Course Objectives:	Up on completion of this course, the student will have reliably demonstrated the ability to: • Describe and explain anatomical and physiological changes during pregnancy. • Identify and recognize the essentials of gynecology and obstetrics • Able to detect and treat any physical and psychological defect. • Assess physical health and identify any musculoskeletal or neuromuscular problems. • Treat any problem with appropriate physiotherapy skills. • Develop plan of treatment.

Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	Topics Coverage
Session1(Week1)	• introduction • Anatomy of female genital tract • Hormonal of female reproductive system • The major maternal physiological adaption to pregnancy • Posture changes during pregnancy.
Session2(Week2)	• Antenatal care • Antenatal education. • Aims of adequate antenatal care. • Psychological preparation for pregnant woman • Medical antenatal care for normal pregnant woman (objectives, frequency of examinations and reassurance & advices).
Session3(Week3)	• Effect of antenatal exercise on mother • Effect o antenatal exercise on fetal wellbeing • Role of the physiotherapists during pregnancy • Warning signs
Session4(Week4)	• Risk pregnancy. • Introduction • Exercises programs for high risk pregnancy. • Pregnancy related hypertension. • Pre-eclampsia • Etiology of pre-eclampsia • Symptoms and signs of pre-eclampsia • Diagnosis of pre-eclampsia • Physical therapy management
Session5(Week5)	• Diabetes and pregnancy. Type of diabetes in pregnancy Screening for diabetes Risk factors for gestational diabetes Diagnosis of diabetes • Effect of diabetes on pregnancy Fetal complication Fetal macrosomia • Management of diabetes in pregnancy • Physical therapy program
Session6(Week6)	• Normal labour Definition Compare between true normal labour and false labour pain Types of vaginal delivery Stages of labour Management of labour • Forceps delivery Definition Risks to patient after use forceps delivery

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	Risks to the baby after use forceps delivery
Session7(Week7)	• A vacuum extraction Definition Risks to patient after use A vacuum extraction Risks to the baby after use A vacuum extraction • Episiotomy Introduction Types of episiotomy incisions Uses of episiotomy • Post-partum exercises • Values of exercises
Session8(Week8)	• Normal puerperium Definition Physiological changes Local changes General changes • Management of the puerperium • Postnatal problems • Values of post-partum exercises Prophylactic Curative Lactational • Contraindications postnatal exercises • Massage during labour Back massage Abdominal massage Leg massage
Session9(Week9)	• Anatomy of the female lower urinary tract. • Functions of the female lower urinary tract. • Affect the pregnancy on lower urinary tract. • Prevention of lower urinary tract during labour.
Session 10 (Week 10)	• Urinary incontinence (UI). • Types of urinary incontinence • Grades of urinary incontinence • Evaluation and treatment of stress urinary incontinence • Physical therapy for pubococcygeus muscle • Physiotherapy for pre and post-operative cases
Session 11 (week 11)	• Displacements of the uterus. • Introduction • Types of displacements of the uterus • Causes of displacement of the uterus • Symptoms of displacement of the uterus • Management of displacement of the uterus • Physical therapy management. • Muscle re-education • Biofeedback (kegel perineometer and EMG biofeedback) Mid-stream urine flow (stop test) Cyriax method

	Resistive exercise for pubococcygeus muscle An inflated cuffed catheter Vaginal cones
Session 12 (week 12)	• Retroversion and retroflexion of the uterus. • Definitions • Varieties of retro-version-flexion • Symptoms of retroversion • Treatment of retroversion • Physical therapy management
Session13(Week 13)	• Hysterectomy. Definition Types of hysterectomy Open surgery Minimally invasive procedures (MIP) Comparison between abdominal hysterectomy and MIP Risks of hysterectomy Physical therapy of hysterectomy Pre-operation... Aim and treatment pre-operation hysterectomy Post-operation... Aim and treatment post-operation hysterectomy • Values exercises after hysterectomy.
Session 14 (week 14)	• Cesarean section (CS) • Impairments\ problem due to CS • Indications for CS • Complications • Role of physical therapy in CS
Session 15 (week 15)	• Menopause. • Definition • Types of the menopause • Menopause changes • Healthy living • Tips for dealing with hot flushes • Hormone replacement therapy • Management of the menopausal changes
Session 16 (week 16)	• Uses of Electrical modalities in obstetrics. • Electrical modalities during pregnancy. • Electrical modalities during labour. • Electrical modalities during post-natal period.
Session 17 (week 17)	Uses of Electrical modalities in gynecology. • After normal delivery Perineal pain Symphysis pubic pain Backache/ neckache Hemorrhoids After pains Breast engorgement, mastitis, block ducts and cracked nipple. Scanty of milk production • After cesarean section operation Post operation pain relief (C.S, abdominal hysterectomy) Post operation wound healing (C.S, abdominal hysterectomy)

	Post operation paralytic ileus (C.S, abdominal hysterectomy)
Session 18 (week 18)	Breathing exercises: • Respiration • Muscles of Respiration • Anatomy of the diaphragm • General principles for teaching breathing exercises • Diaphragmatic breathing exercises • Costal breathing exercises • Sternal breathing exercises
Session 19 (week 19)	Pelvic girdle • Anatomy of pelvic bone • The joints and ligaments attached • The muscles support for pelvic joint
Session 20 (week 20)	Pelvic rocking exercises • Pelvic rocking exercises • Upward backward "posterior pelvic tilting". From crock lying position From creeping position From standing position • Downward forward "anterior pelvic tilting". From crock lying position From creeping position From standing position • Values of pelvic rocking exercises
Session 21 (week 21)	• Polycystic ovarian syndrome (PCOS) Definition Common symptoms Causes of PCOS Pregnancy complication Diagnosis of PCOS Common medical treatment Physiotherapy interventions
Session 22 (week 22)	Postural Correction. • What is posture? • Good posture • Postural changes during pregnancy • Postural correction from crock lying position • Postural correction from supine lying position • Postural correction from sitting position • Postural correction from standing position
Session 23 (week 23)	Positional education: • Cross sitting position • Squatting position • Prone kneeling position
Session 24 (week 24)	Relaxation techniques: • Objectives of relaxation training during pregnancy • Principles of relaxation • Mental relaxation • Physical relaxation

Session 25 (week 25)	Abdominal exercises: • Functions of the abdominal muscles • Values of abdominal exercises • Testing the strength of the abdominal muscles • Types of the abdominal exercises Static abdominal exercises. Dynamic abdominal exercises.
Session 26 (week 26)	Arm exercises: • anatomy of Pectoralis major muscle • Types of arm exercises • Values of arm exercises Circulatory exercises • Technique of circulatory exercises • Circulatory exercises for lower limb • Circulatory exercises for upper limb
Session 27 (week 27)	Varicose veins in pregnancy • Introduction • Physical therapy management of varicose veins. • Signs of improvement. • Indications of improvement
Session 28 (week28)	• Legs and feet exercises. • Leg cramps • Treatment • Feet changes during pregnancy • Prevention and treatment
Session 29 (week29)	Revision and discussion
Week (30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from beaks promptly and remaining until classis dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication .Content of the courses is revised on an on going basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to student s as soon as possible. Time table may also be revised.

Internal medicine and physiotherapy

1	**Course name**	**Internal medicine and physiotherapy**
2	**Course Code**	PT402
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Physiotherapy
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of pulmonary diseases, cardiac diseases and cardiopulmonary physiotherapy. In addition to dealing with patients admitted in intensive care unit
Textbooks required for this Course:	• Essentials of Cardiopulmonary physiotherapy by Ellen Hillegass 3rd Edition 2010 • Therapeutic Exercise, foundations and techniques by Carolyn Kisner / Lynn Colby 6th Edition 2013 • General Pathology and Internal Medicine for Physical Therapists by Gabriele Steffers, Susanne Credner 2012 • http://www.heart.org/HEARTORG/Conditions/More/CardiacRehab/Cardiac-Rehab_UCM_002079_SubHomePage.jsp • https://www.bhf.org.uk/heart-health/living-with-a-heart-condition/cardiac-rehabilitation • http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/diagnosing-and-treating/pulmonary-rehabilitation.html • https://www.blf.org.uk/support-foryou/exercise/pulmonary-rehabilitation • Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the types and mechanisms of breathing technique • Identify patient's condition, problem • Recognize the cardiopulmonary needs of each patient • Construct a series of outcome measures and therapeutic plan • Write well developed case report

	• Respect the patient's privacy and preserve confidentiality
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session1(Week 1)	1. **Anatomy**: Review the regional anatomy of thorax; upper respiratory tract - trachea and bronchial tree; lungs and bronchopulmonary segments: muscles of respiration; heart and great Vessels: Movements of the chest wall and surface anatomy of lung and heart. **2. Assessment** Physical assessment in cardio respiratory dysfunction: - **Vital signs:** temperature, pulse rate, blood pressure and respiratory rate. - **Inspection:** general appearance (level of consciousness, body type and extremities evaluation for clubbing, oedema & cyanosis), facial characteristics, evaluation of neck, Posture (recumbent, erect), breathing pattern (rate, rhythm, use of accessory muscles), Chest movement (Symmetry, intercostal and diaphragmatic components), Chest deformity (Barrel chest, Pigeon chest), spinal deformity (scoliosis, kyphosis, kyphoscoliosis), Sputum (colour, type, volume, consistency), Cough (types productive / non productive, presence of a normal cough reflex), - **Palpation:** Tactile and vocal fremitus, mobility of thoracic spine and rib cage. - **Percussion:** dullness and hyper resonance (percussion of lungs), determination of the upper border of the liver and diaphragmatic excursion. - **Auscultation:** Normal and abnormal breath sounds (bronchial sounds), vesicular sounds and heart sounds. - **Measurement:** Chest expansion at different levels (axillary, nipple, xiphoid); exercise tolerance (six minute walking test), Post operative range of motion and muscle assessment. - **Investigation:** chest x-ray, blood analysis, pulmonary function test and electrocardiography & others.
Session2(Week 2)	**Physiology**: Review the mechanics of respiration inspiration & expiration, lung volumes, respiratory muscles, Compliance of lung and chest wall, work of breathing, dead space gas exchange on lung and pulmonary circulation.
Session3(Week 3)	**Assessment** physical assessment in cardio respiratory dysfunction: **Vital signs:** temperature, pulse rate, blood pressure and respiratory rate. **Inspection:** general appearance (level of consciousness, body type and extremities evaluation for clubbing, oedema & cyanosis), facial characteristics, evaluation of neck, Posture (recumbent, erect), breathing pattern (rate, rhythm, use of accessory muscles), Chest movement (Symmetry, intercostal and diaphragmatic components),

	Chest deformity (Barrel chest, Pigeon chest), spinal deformity (scoliosis, kyphosis, kyphoscoliosis), Sputum (colour, type, volume, consistency), Cough (types productive / non productive, presence of a normal cough reflex), - **Palpation:** Tactile and vocal fremitus, mobility of thoracic spine and rib cage. - **Percussion:** dullness and hyper resonance (percussion of lungs), determination of the upper border of the liver and diaphragmatic excursion. - **Auscultation:** Normal and abnormal breath sounds (bronchial sounds), vesicular sounds and heart sounds. - **Measurement:** Chest expansion at different levels (axillary, nipple, xiphoid); exercise tolerance (six minute walking test), Post operative range of motion and muscle assessment. **Investigation:** chest x-ray, blood analysis, pulmonary function test and electrocardiography & others.
Session 4 (Week 4)	General medical condition **Hypertension** - define and briefly outline the etiology, clinical features, investigation and management. **Hypotension** -define and briefly outline the etiology, clinical features, investigation and management. **Metabolic diseases** **1**- Diabetes mellitus - define and briefly outline the etiology, clinical features, investigation and management. 2- obesity - define and briefly outline the etiology, clinical features, investigation and management.
Session 5 (Week 5)	**Renal failure** 1. Acute Renal Failure: define and briefly outline the etiology, clinical features, investigation and management. 2. Chronic Renal Failure: define and briefly outline the etiology, clinical features, investigation and management. - **Peptic ulcer disease** - Briefly outline the etiology, clinical features, investigation and treatment. - **Inflammatory bowel disease** - Briefly outline the etiology, clinical features, investigation and treatment.
Session6(Week6)	Indication, principles, precautions, goals & procedure of breathing exercises: • Deep breathing exercise • Nose exercise: aims and graduation of nose exercises. • Diaphragmatic breathing, localized basal expansion, apical expansion, specific segmental exercise raising the resting respiratory level.

	• Pursed lip breathing: benefits and graduation of pursed lip breathing. • Localized breathing exercises: upper costal, lower costal, apical and sternal breathing exercises. • Chest mobilization exercises and belt exercise. • Relaxation exercises and positions for the breathless patient – high side lying, forward lean sitting, relaxed sitting, forward lean standing, relaxed standing
Session7 (Week 7)	* Controlled breathing during walking and during functional activity. * Exercise for the breathless patient: exercise tolerance testing and exercise program. * The technique of huffing and coughing, forced expiratory technique, vibratory chest shaking and percussion. * Technique of Postural drainage, including indications, general precautions and Contra-indications, preparation drainage of individual bronchopulmonary segments, treatment procedure & assessment, modified postural drainage and continuing Postural drainage as a home program. * Massage and stretching techniques, electro and hydrotherapy modalities for cardio respiratory patients
Session8 (Week 8)	* Outline the history of mechanical respiration, Defination of the following terms a) Respirator b) Lung ventilator c) Resuscitators d) Bird ventilator e) IPPB f) PEEP g) CPAP h) SIMV i) PEEP. Classification of ventilators by third cycling control (volume cycling, pressure cycling, time cycling and mixed cycling. * The principles of operation of commonly used ventilators and outline the use of the following types: i) Bear ii) Bennett iii) Emerson iv) Bird.
Session9 (Week 9)	Outline the principles of Aerosol Therapy. • Description of the physical properties of aerosol and their deposition in the alveoli • Description of the principles of nebulizers. • Outline the principles of humidification therapy and methods of correcting humidity deficits. • Description of the principles of operation of pass - over humidifiers and bubble – diffusion humidifiers. • Description of the techniques of sterile nasopharyngeal and endotracheal suctioning.
Session10 (Week10)	**Respiratory tract infection** **Chronic obstructive lung/pulmonary diseases** - Characteristics of patients with obstructive lung disease - General clinical problems. - General physiotherapy intervention for COPD - Guidelines for exercise prescription for patients with COPD. **a- Chronic bronchitis** - Symptoms, Causes, Diagnosis and Treatment

Session11 (Week11)	**b- Emphysema** Symptoms, Causes, Diagnosis and Treatment - ➢ Clinical problem of chronic bronchitis and emphysema ➢ Treatment goal and therapeutic plan for chronic bronchitis and emphysema **c- Bronchiectasis** Symptoms, Causes, Diagnosis and Treatment - ➢ Clinical problem of bronchiectasis Treatment goal and therapeutic plan for bronchiectasis
Session12 (Week12)	**d- Cystic fibrosis** Symptoms, Causes, Diagnosis and Treatment - ➢ Clinical problem of cystic fibrosis ➢ Treatment goal and therapeutic plan for cystic fibrosis **e- Asthma** - types of asthma Symptoms, Causes, Diagnosis and Treatment - ➢ Clinical problem of asthma Treatment goal and therapeutic plan for asthma
Session 13 (Week 13)	**Restrictive lung/pulmonary diseases** - Pulmonary and extra pulmonary causes of restrictive lung disease - General clinical problems. - General physiotherapy intervention for RLD - Guidelines for exercise prescription for patients with RLD. **a- Lung cancer** - Stages of lung cancer - Symptoms, causes, diagnosis and treatment
Session 14 (Week 14)	**b- Pneumonia** - Classification - Signs and Symptoms - Complication, diagnosis, treatment ➢ Clinical problem of chronic pneumonia ➢ Treatment goal and therapeutic plan for pneumonia **c- Tuberculosis** - Signs and Symptoms - Complication, diagnosis, treatment ➢ Clinical problem of tuberculosis ➢ Treatment goal and therapeutic plan for tuberculosis
Session 15 (Week 15)	**d- Atelactasis** - Signs and Symptoms - Causes of obstructive and non obstructive atelactasis - Diagnosis - Treatment **e- Pleural disease** **Dry pleurisy**

	- Symptoms, causes , diagnosis and treatment **Pleural effusion** - Etiology - Symptoms, causes, diagnosis and treatment **f- Empyema** - Etiology - Symptoms, causes , diagnosis and treatment
Session 16(Week 16)	➢ **pulmonary surgery** - Indication and Types of surgery - Types of incision - Pre operative physiotherapy preparation - Post operative problem list - Post operative therapeutic goals - Post operative therapeutic plan ➢ **pulmonary rehabilitation** - Exercise regimen - Breathing exercises - Long term home program - Improve quality of life
Session 17 (Week 17)	**Midterm Exam**
Session 18 (Week 18-20)	Congenital heart defects ➢ Acyanotic Congenital Heart 1- Patent Ductus Arteriosus PDA - Characteristics - Signs, symptoms and diagnosis, treatment 2- Atrial Septal Defects ASD - Characteristics - Signs, symptoms and diagnosis, treatment
Session 19 (Week 19)	3- Ventricular Septal Defects VSD - Characteristics - Signs, symptoms and diagnosis, treatment 4- Atrioventricular Septal Defects AVSD - Characteristics Signs, symptoms and diagnosis, treatment
Session20(Week 20)	➢ Cyanotic Congenital Heart 1- Tetralogy of Fallot - Characteristics - Signs, symptoms, diagnosis and treatment 2- Transposition of the great arteries - Characteristics - Signs, symptoms, diagnosis and treatment 3- Double-outlet right ventricle (DORV) - Characteristics - Signs, symptoms, diagnosis and treatment 4- Hypoplastic Left Heart Syndrome HLHS - Characteristics - Signs, symptoms, diagnosis and treatment

Session21(Week 21)	➢ Cardiac surgery - Types of approaches 1- Open heart surgery - Indications 2- Closed heart surgery - Indications ➢ Aims of physiotherapy following cardiac surgery ➢ Pre-operative training ➢ Post-operative physiotherapy management ➢ Complications following cardiothoracic surgery Factors that increase the postoperative complications
Session22(Week 22)	- Complications following cardiothoracic surgery a- Respiratory problems/ Physiotherapy for the respiratory complications b- Cardiac complications/ Physiotherapy for the cardiac complications c- Deep venous thrombosis/ Physiotherapy to prevent DVT or dealing with DVT Wound infection/ Physiotherapy for healing and scar management
Session 23 (Week 23)	➢ **Heart failure** - Definition - Manifestations of right side heart failure - Manifestations of Left side heart failure - Causes, Signs, symptoms, diagnosis and treatment
Session 24 (Week 24)	➢ **Ischemic heart disease** - Predisposing factors - Pathogenesis - Clinical feature a- Mild degree (angina pectoris) b- Angina at rest c- Unstable angina d- Acute myocardial infarction (acute M.I.) - Investigations and Treatment ➢ **Myocardial infarction** - Definition - Causes, Pathophysiology, Clinical feature and Diagnosis ➢ **Cardiac rehabilitation**
Session 25 (Week 25)	- **Phases of cardiac rehabilitation** **a- Phase I (Immediate inpatient phase)** - The goals of rehabilitation during Phase I - Therapeutic plan during phase I - Termination criteria of phase I Exercise Session **b- Phase II** - The goals of rehabilitation during Phase II

مكونة الوحدة الوطنية
الوزير
وزارة التعليم العالي والبحث العلمي

	- Training Program a- Specific monitoring prior each session of phase II b- Conditioning exercises c- Free exercises d-Return to work after phase II **c- Phase III (home program)** - The goals of rehabilitation during Phase III Suggestions for Exercising At Home
Session 26 (Week 26)	➢ **Principles of intensive care therapy.** a- **ICU equipment's**: Endotracheal tubes. Tracheostomy tubes, Humidifier, ventilators, High frequency ventilators, Differential ventilators, CPAP masks, Suction pump, Electrocardiogram, Pressure monitors - arterial, central venous, pulmonary artery, Pressure monitors - arterial, central venous, pulmonary artery and pulmonary wedge: intracranial and temperature monitors.
Session 27 (Week 27)	**Assessment:** Special instructions pertaining to any operation performed, respiration, level of consciousness, color - blood pressure, pulse temperature, sputum, expectorated (color and quantity), drugs (time last dose of analgesic given), drains, presence of Pacemaker or Intra aortic balloon pump, ECG and blood gas results. **Handing techniques** Turning, tilting, incision support, bedside mobility, stander, walker
Session 12 (Week 28)	➢ Geriatric care rehabilitation - Life history - The Ageing Body: Theories of Ageing (Physiological & Environmental) - Locomotor System - Cardio-Respiratory System - Neurological Function - Autonomic Function - Metabolic Changes - Mental Function - Approach to the treatment: Interview, Examination and Aims of Intervention - Role of the Physiotherapist - Home based rehabilitation program
Session 13 (Week 29)	Revision and discussion
(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy

	and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Rehabilitation of injuries and neurological diseases

1	**Course name**	**Rehabilitation of injuries and neurological diseases**
2	**Course Code**	PT403
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Physiotherapy
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will include: the anatomy and physiology of the nervous system. Nervous system diseases and injuries. Features of each diseases and legion of each part of nervous system. Physical therapy and rehabilitation of the central and peripheral nervous systems separately. the typical treatment plan of each neuro-dysfunction.
Textbooks required for this Course:	• The Clinical Science of Neurologic Rehabilitation, OXFORD UNIVERSITY PRESS, Second edition, BRUCE H. DOBKIN, M.D. • Pathophysiology made incredibly easy, Lippincott Williams & Wilkins, 4th edition, Elizabeth Rosto • Principles of Anatomy and physiology, John Wiley & Sons, Inc, 12th edition, Gerard J. Tortora, Bryan Derrickson. • A Massage Therapist'sGuide to Pathology, Lippincott Williams & Wilkins, 4th edition, Ruth Werner. • Case Studies in Neurological Rehabilitation, CAMBRIDGE UNIVERSITY PRESS, First edition, Tarek A.-Z. K. Gaber • Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the in addition to hand out
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based presentation, group interaction and discussion, and active participation.

Course Objectives:	Upon completion of this course, the student should be able to: • Understand the normal anatomy and physiology of the nervous system. • Understand the specific features of the CNS & PNS. • Understand the specific features of the central nervous system and the peripheral nervous system during and after injury. • Study and know diseases that affect the nervous system. • Identify the problem, disease or disorder of the nervous system the patient has. • Recognize the motor and/or functional needs of each case. • Construct a series of outcome measures and therapeutic plan. • Write well developed case report. • Respect the patient's privacy and preserve confidentiality.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10% Final Exam 60 % A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1- 3)	1. Neuroanatomy and neurophysiology of the Central and peripheral nervous system. 2. Neuroanatomy: Blood supply
Session 2 (Week 4)	Myotome & dermatome
Session 3 (Week 5)	Hypertonia
Session 4 (Week 6)	Dyskinesia
Session 5 (Week 7 - 8)	Cerebellar disorders
Session 7 (Week 9- 10)	Upper motor neuron pathologies: CVA, TBI, MS, PD, SCI, MND
Session 8 (Week 11-12)	Lower motor neuron pathologies: GBS, Bell's palsy, TN, Muscular dystrophy
Session 9 (Week 13- 14)	Injuries to the peripheral nerves (Neuropathy)
Session 6 (Week 15)	**Midterm Exam**
Session 10 (Week 16)	Evidence-based practice
Session 10 (Week 17)	Assessment of neurological conditions
Session 10 (Week 18)	Spasticity management
Session10(Week19-20)	Common interventions for neurological disorders
Session10(Week 21-22)	Stretching & Strengthening Proprioceptive neuromuscular facilitation
Session10(Week23- 24)	Task-repetitive (oriented training) Reaching & Grasping training
Session10(Week25-26)	Sit-To-Stand training Trunk mobilization
Session11(Week 27- 28)	Gait training Balance & Coordination Somatosensory training (Proprioception & Vision)
(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is

	dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Orthopedics and physical therapy

1	**Course name**	**Orthopedics and physical therapy**
2	**Course Code**	PT404
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course builds on previous knowledge of anatomy, pathology, physiology, biomechanics, and musculoskeletal assessment. The course provides fundamental knowledge in clinical musculoskeletal disorders related to physical therapy practice including: fractures, soft tissue injuries, arthritis, knee and hip joints replacement, and bone diseases. Basic assessment methods of musculoskeletal assessment of peripheral joints will be introduced in this course and will be related to clinical situations. Physical therapy treatment and rehabilitation of peripheral joints will be taught to prepare students for clinical situations. This course will be taught by lectures, active learning, and case studies.
Textbooks required for this Course:	• Examination, Evaluation and Intervention, Fifth Edition by Mark Dutton 2019

	• Orthopaedic Physical Therapy by Robert Donatelli, Michael Wooden 4th Edition - July 27, 2009 • Orthopedic Physical Assessment 3. Maitland's Peripheral Manipulation • Physiotherapy in OrthopaedicsA Problem-Solving Approach by Karen Atkinson, Fiona Coutts, Anne-Marie Hassenkamp 2nd Edition - March 22, 2005 • Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the in addition to hand out
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of the course the sdudents should be able to: • Demonstrate ability of writing Subjective and Objective parts of the SOAP note for musculoskeletal condition. • Conduct appropriate subjective examination musculoskeletal condition of upper and lower extremities • Define basic terminology related to musculoskeletal disorders • Differenticate between signs and symptoms of various bones and muscles disorders • Demonstrate a critical understanding of the impact of diseases of muscles and bones on human function • Describe the causes and mechanism of bone and soft tissue disorders, injuries, and the mechanism of recovery .
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10% Final Exam 60 % A 60 % is required for a pass in this course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1-3)	A . Introduction to Orthopaedics Introduction to orthopedic terminology, types of pathology commonly dealt with, clinical examination, common investigations and outline of non - operative & management.
Session 2 (Week 4-5)	General medical condition B. PRINCIPLES OF OPERATIVE TREATMENT List indications, Contra-indications and briefly outline principles of Arthrodesis, Arthroplasty, Osteotomy, Bone grafting and Tendon - Transfers. C. SPRAINS AND MUSCLE STRAINS. List common sites of sprains and muscle strains and describe the clinical manifestations and treatment.
Session 3 (Week 6- 9)	D. FRACTURES & DISLOCATIONS: General Principles outline the following: 1. Types of Fractures including patterns, open and closed fractures and fracture – dislocations. 2. Difference between dislocation & subluxation. 3. General & Local signs & symptoms of fractures, dislocations.

	4. Principles of management of fractures, dislocations. 5. Prevention & treatment of complications including: Fracture, Volkmann's ischemic contracture, Sudek's Atrophy, Carpal Tunnel syndrome, Myositis-ossificans, and shoulder - hand syndrome. 6. Fracture healing. .
Session4(Week10-12)	E. UPPER LIMB FRACTURES & DISLOCATIONS 1. Enumerate major long bone fractures and joint injuries. 2. Briefly describe their clinical features, principles of management and complications. F. LOWER LIMB FRACTURES & DISLOCATIONS 1. Enumerate major long bone fractures and joint injuries. 2. Briefly describe their clinical features, principles of management and complications.
Session5(Week13-15)	G. SPINAL FRACTURES AND DISLOCATIONS Outline the mechanism, clinical features, and principles of management and complications of spinal injuries. H. RECURRENT DISLOCATIONS Outline the mechanism, clinical features principles of management and complications of recurrent dislocation of the shoulder and patella.
Session6(Week16-17)	I. PEDIATRIC SURGERY 1. The child who limps. 2. Child with fractures. J. AMPUTATIONS. 1. Classify amputations, list indication for surgery. 2. Outline pre - operative, operative and prosthetic management. 3. Outline prevention and treatment of complications.
Session 7 (Week 18)	**Midterm Exam**
Session8(Week19-20)	K. BONE & JOINT INFECTIONS Outline the etiology, clinical features, management and complications of: septic arthritis, ostitis, osteomyelitis, Tuberculosis (including spinal T.B) L. BONE & JOINT TUMORS - Classify and outline the clinical features, management and complications of the following benign/malignant bone and joint tumors, osteoma, osteosarcoma, osteoclastoma, Ewing's sarcoma, multiple myeloma
Session9(Week21-23)	M. CHRONIC ARTHRITIS Outline the pathology, clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis, Osteoarthritis of major joint's and spine, Ankylosing spondylitis. n. low back ache, painful arc syndrome, tendonitis fascitis & spasmodic torticollis Outline the above including clinical features and management.
Session10(Week24- 26)	O. Spinal deformities Classify spinal deformities and outline the salient clinical features, management and complications. .

	P. POLIOMYELITIS Describe the pathology, microbiology, prevention, management and residual problems of polio; outline the treatment of residual paralysis including use of orthoses. Principles of muscle transfer.
Session 11 (Week 27)	Q. CONGENITAL DEFORMITIES Outline the clinical features and management of CTEV, CDH, Flat foot, club foot, vertical talus, knock knees, limb deficiency (Radial club hand and femoral, tibial and fibular deficiencies, meningomyelocele, Arthogryposis multiplex congenita, poly drict, osteogenesis imperfecta). R. PERIPHERAL NERVE INJURIES Outline the clinical features and management, including reconstructive surgery of: 1. Radial, median and ulnar nerve lesions. 2. Sciatic and lateral popliteal nerve lesions. 3. Brachial Plexus injuries including Erbs Palsy Klumpke's Paralysis, crutch palsy.
Session 12 (Week 28&29)	S. HAND INJURIES Outline clinical features, management and complications of: Skin and soft tissue injury, Tendon injury, Bone and joint injury. T. LEPROSY Outline clinical features, management and complications of neuritis, muscle paralysis, tropic ulcer of hand & feet deformities.
Session 12 (Week 30)	Revision and discussion
(Week 31-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Sport injuries & rehabilitation

1	**Course name**	**Sport injuries & rehabilitation**
2	**Course Code**	PTR405
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is an introduction to the Definition & role of Physical therapy, Methods of Physical therapy, Characteristics of Physical Therapist, Physical Therapy department, Soft tissue manipulation, Manual massage, Isokinetic training, Electro diagnosis, Gait, Uses of computer in physiotherapy and in the end the evaluation of the patients.
Textbooks required for this Course:	• Tidy's physiotherapy, Churchill Livingstone, Stuart Porter, Fourteenth Edition 2011. • Sports InjuriesPrevention, Treatment and Rehabilitation, Fourth Edition ByLars Peterson, Lars Peterson, Per A.F.H. Renstrom 4th edition 2016 • Rehabilitation of sports injuries: scientific basis Reviewed by Jack Edward Taunton 2003 • Sports Injury Prevention and Rehabilitation Integrating Medicine and Science for Performance Solutions Edited By David Joyce, Daniel Lewindon 2015 • Principle of physical therapy, Peter G. Tsarfia, M.D, Grune Stratton. • Complete reflexology (therapeutic foot message for health and will-being), Mustard 1999 Designed by The Bridgewater book company. • Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the in addition to hand out
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation, practical.
Course Objectives:	• Upon completion of this course, the student will have reliably demonstrated the ability to: • Use and apply each principle of physical therapy individually or all with the priority of one principle over the other.

	• Apply the regulations and laws issued by the General Assembly of Physiotherapy in the same direction, the direction of the patient and the direction of the team • Apply the basic principles of physiotherapy towards the patient in practice. • Collect patient information and use it to plan for the patient. • Stop one starter and replace it with another when necessary. Dr. General and Transferred Skills
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10% Final Exam 60 % A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Physiologic Factors in Rehabilitation
Session 2 (Week 2)	Reaction to injury
Session 3 (Week 3)	Response of Joint Structures to Injury
Session 4 (Week 4)	Effects of immobilization on the muscles, joints, ligaments and connective tissue
Session 5 (Week 5)	Continuous passive motion
Session 6 (Week 6 & 7)	Effects of remobilization on the muscles, joints
Session 8 (Week 9& 10)	Effects of remobilization on ligaments and connective tissue
Session 9 (Week 11& 12)	Static and dynamic flexibility
Session 10 (Week 13	Peripheral Receptor Afferent Activity
(Week 14)	**Midterm Exam**
Session 11 (Week 15)	Applying Principles of Motor
Session 12 (Week 16)	Basic Strategies for Implementing
Session 13 (Week 17)	Types of therapeutic exercise
Session 14 (Week 18)	Therapeutic Exercise for Neuromuscular Strength/Endurance
Session 15 (Week 19)	Static and dynamic exercises
Session 16 (Week 20)	concentric and eccentric contraction exercise
Session 17 (Week 21)	Chronic Degenerative Injuries
Session 18 (Week 22)	Chronic Degenerative Injuries
Session 19 (Week 23)	Isotonic Exercise, Resistance Exercise
Session 20 (Week 24)	Isotonic Exercise, Resistance Exercise
Session 21 (Week 25)	Modalities for acute care
Session 22 (Week 28)	Exercise in rehabilitation
Session 23 (Week 29)	Revision and discussion
(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to

	ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Electro and Hydro Therapy

1	**Course name**	**Electro and Hydro Therapy**
2	**Course Code**	PT406
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Physiotherapy
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the anatomy of the normal female pelvic, female genital tract and lower urinary tract and they will deal with diseases as urinary incontinence, genital prolapse displacement of the uterus. Students will practice of basic exercises for gynecology and obstetrics as breathing exercises, pelvic floor exercises, posture correction, leg exercises, arm exercises, circulatory exercises and postpartum exercises especially after normal labour and cesarean section to help improving and prevent any complications. the electrical modalities will use to relief any joint pain during pregnancy as TNES and increases joint mobility due to analgesic effects.
Textbooks required for this Course:	• physiotherapy in obstetrics by Maria Ebner third edition. • Electrophysical Agents Evidence-based Practice by Tim Watson, Ethne Nussbaum 13th Edition - March 17, 2020 • Hydrotherapy A Brief Summary of the Practical Value of Water in Disease for Students and Practicians of Medicine by William; H. Dieffenbach • Textbook of Electrotherapyby Jagmohan Singh DOI 10.5005/jp/books/11673 • Clayton's Electrotherapy And Actinotherapy: Including The Physics Of Movement And HydrotherapyPauline M. Scott 1980 • Additional textbooks, handouts, and weblinks may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, practicing exercises.

Course Objectives:	Up on completion of this course, the student will have reliably demonstrated the ability to: • Describe and explain anatomical and physiological changes during pregnancy. • Identify and recognize the essentials of gynecology and obstetrics • Detect and treat any physical and psychological defect. • Assess physical health and identify any musculoskeletal or neuromuscular problems. • Treat any problem with appropriate physiotherapy skills. • Develop plan of treatment.
Course Assessments	Midterm exam 20 % Activities 10% Attendances 10% Final Exam 60 % A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session1(Week1)	Basic components of electric current – electrons, protons, neutrons, ions, matter, molecules
Session2(Week2)	Current electricity – static electricity
Session3(Week3)	electric charge, conductors, Insulation, unit of electric current
Session4(Week4)	Conduction of electricity
Session5(Week5)	Resistance, factors effecting resistance with example in human body
Session6(Week6)	Ultrasonic therapy- properties of ultrasonic field
Session7(Week7)	Application of Microwave Diathermy
Session8(Week8)	therapeutic effects of Microwave Diathermy
Session9(Week9)	**Midterm exam**
Session 10 (Week 10)	Infra-red: physiological effects and treatment procedure
Session 11 (week 11)	Infra-red: evaluation of therapeutic effects
Session 12 (week 12)	Paraffin wax & moist heat: effects and indications
Session13(Week 13)	Paraffin wax & moist heat: Principal, technique, and methods of application
Session 14 (week 14)	Cryotherapy: physiological effects and methods
Session 15 (week 15)	Cryotherapy: Preparation and techniques of application
Session 16 (week 16)	Hydrotherapy: basic principal of hydrotherapy
Session 17 (week 17)	Hydrotherapy: techniques of application
Session 18 (week 18)	Clinical application of hydrotherapy on osteoarthritis
Session 19 (week 19)	Clinical application of hydrotherapy on hemiplegia
Session 20 (week 20)	Evaluation of the therapeutic effects of hydrotherapy
Session 21 (week 21)	Application of ultraviolet radiation
Session 22 (week 22)	Assessment of therapeutic effects of infra-red and UV radiation
Session 23 (week 23)	Iontophoresis – Mechanism and biophysical effect

Session 24 (week 24)	Iontophoresis - Medication dosage, medicated ions used, techniques of application.
Session 25(week 25)	Electro diagnostic tests – FG test, types, strength duration curve
Session 26(week 26)	Interferential therapy (IFT) – physiological effects
Session 27 (week 27)	Interferential therapy (IFT), therapeutic indications, methods of application, contraindication and precautions
Session 28 (week 28)	Principles and practice of laser therapy
Session 29 (week 29)	Revision and discussion
Session30(week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from beaks promptly and remaining until classis dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an on going basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to student s as soon as possible. Time table may also be revised.

Hospital Practical Training II

1	**Course name**	Hospital Practical Training II
2	**Course Code**	PT407
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	None
7	**Program offered the course**	Physiotherapy Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course will include: basic of general clinical and hospital training, real practical patient's evaluation

	\identify and know the treatment units of the Physiotherapy Department/ apply types of the orthopedic and neuro evaluation tests to the real patients \ apply the treatment plan to ward indusial patient\ The ability to follow up on the patient, modifying and stopping the treatment plan according to the patient's condition \ Treatment plan for neuro-patients
Textbooks required for this Course:	• Therapeutic Exercise_ Foundations and Techniques (2012) • Tidy's physiotherapy, Churchill Livingstone, Fourteenth Edition 201, Stuart Porter. • Muscle Testing. Techniques of manual examination, W.B. Saunders Company, 6th Edition, Helen J. Hislop& Jacqueline Montagomery. • Measurement of joint motion, F.A. Davis Company, 4th Edition, Cynthia C. Norkin& D. Joyco White. • Journal of Physical Therapy • Additional textbooks, handouts, and weblinks may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Real practice– case study-based presentation, group interaction and discussion,and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand how to use the right way to make a general assessment and patient evaluation. • Apply the treatment plan to the real patients • Stand on the right way from any problem that buts the patient in the risk. • Identify the problem, disease or disorder the patient has • Construct a series of outcome measures and therapeutic plan • Write well developed case report • Respect the patient's privacy and preserve confidentiality.
Course Assessments	20% homework & assignment / presentation/ case report 20% case study 60% final practical exam and practical A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1- 3)	1- Treatment plan making

	2- How to follow up the treatment plan 3- How to change treatment plan
Session 2 (Week 4 -7)	1- Describe how to apply the general patient practice treatment plan described to the patient
Session 3 (Week 7 -11)	1- Therapeutic exercise given to neuro-defect patients a- Hypertonic and spasticity exercise b- CVA c- GBS
Session 4 (Week 11-13)	a- MS b- PSD c- TBI
Session 5 (Week 14 - 17)	a- Amyotrophic lateral sclerosis b- Spinal cord injuries c- Cerebral palsy
Session 6 (Week 18-19)	passive exercise, Active and strengthen exercise and Stretching exercise
Session7(Week20-22)	Respiratory physiotherapy and chest exercise
Session 8 (Week23-25)	Uren system physiotherapy
Session9(Week26-27)	Buren and surgery physiotherapy
Session 10 (Week 28)	hydrotherapy unit and Thermotherapy unit
Session 11 (Week 29)	Revision and discussion
Session 12 (Week 30)	**Final practical exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

خامسا: المقررات الدراسية لقسم تقنية الاسنان

أ- المقررات الدراسية للسنة الثانية قسم تقنية الاسنان

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain. • Explain what a cell is? and explain how human organs and systems interact.

	• Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder) • Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color • Receptors and glands • Skin burns and disorders • Scientific terminologies of the main skin structures

Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to

	ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistr

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis. • The metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is

	selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science. • The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing

	needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Microbiology

1	**Course name**	General Microbiology
2	**Course Code**	MT203
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables students to know: * The microorganism and definition of all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells. *Methods and types sterilization and disinfectant. * Culturing and cultivation of Microorganisms and basic way of their identifications
Textbooks required for this Course:	• Text book of microbiology First Published in 2010 by Prem C. Bakliwal forAavishkar Publishers ISBN 978-81-7910-306-7. • https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf • https://open.umn.edu/opentextbooks/textbooks/873 • https://www.britannica.com/science/microbiology • https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/1%3A_Introduction_to_Microbiology • https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells. • Comprehend the fundamentals of molecular microbiology. • Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.

	• Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health. • Understand Microbial Cell Structure, Function and methabolism.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, of microbiology
Session 2 (Week 2)	History of Microbiology
Session 2 (Week 3)	Defining Microbes and Basic concepts and scope of microbiology
Session 3 (Week 4)	Pasteur and spontaneous Generation
Session 4 (Week 5 & 6)	Types of microorganisms
Session 5(Week 7,8)	Classification of microorganisms
Session6(Week 9)	Immunization, antiseptics and antibiotics
Session 7(Week 10)	Microscopy
Session 8(Week 11)	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
Session9(Week 12)	**Bacterial structure& composition**
Session10(Week 13)	Bacterial Genetics
Session11(Week 14 & 15)	Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
Session12(Week 16)	**Midterm exam**
Session13(Week 17)	Isolation and culturing of Bacteria
Session14(Week 18 & 19)	Microbial metabolism
Session15(Week 20)	Classification of bactria
Session16(Week 21)	Dyes and staining (gram stain, acid fast staining, and other staining metods).
Session17(Week22 & 23)	Fungi: 1. what is mycology? 2. Classification and structure 3. Moulds, yeasts and dimorphic fungus. Fungal diseases Algae: 4. Characteristics, structure and division of algae
Session18(Week 24 & 25,26)	Viruses 1. Definition, Characteristics, symmetry and structure of viruses, 2. Classification and growth of Viruses. 3. Detection, multiplication of Viruses. 4. Laboratory methods used for viral detection
Session19(Week 27,28)	Parasites 1. Definition, Characteristics and structure of parasites, 2. Summary of Parasitic Classification (Protozoa and Helminths). 3. Detection, multiplication of Protozoa and Helminths. 4. Laboratory methods used for viral detection
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Histology

1	**Course name**	Histology
2	**Course Code**	MT204
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Histology and Know the different types of tissues of the body Recognize the function performed by each tissue Learn about common terms and definitions used in histology
Textbooks required for this Course:	• DiFiore's atlasof histologywith functionalcorrelations. Junqueira'sBasic Histology. • Histology: An Essential Textbook by D. J. Lowrie Jr 2020 • Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021 • Textbook of Histology by Leslie P. Gartner PhD 2021 • Histology: A Text and Atlas 7th edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015 • Wheater's Functional Histology: A Text and Colour Atlas 3rd edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours

Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire a basic background in histology and comparative histology in different and to understand the properties of cells and their interactions with one another as components of tissues and organs. • Understand how structure and function correlate at the microscopic level and be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination. • Understandthe changes that occur to tissues • Identify the different types of tissues • Recognize the types of tissues and the mechanisms of identifying them • understand the various diagnostic tools and medical equipment in the correct way to discover histological changes • Understand how to distinguish tissue and how it develops • deduce the causes of the changes that have occurred within the tissues
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to histology •histology and its mode of study
Session 2 (Week 2)	• The cell
Session 3 (Week 3)	• Epithelial Tissue
Session 4 (Week 4)	• Connective tissue
Session 5 (Week 5)	• Cartilage
Session 6 (Week 6)	• Bone
Session 7 (Week 7)	• Bone.
Session 8 (Week 8)	Muscle Tissue
Session 9 (Week 9)	Nerve Tissue
Session 10 (Week 10)	•Nervous System
Session 11 (Week 11)	The Immune System &
Session 12(Week 12)	Lymphoid Organs
Session 13(Week 13	Blood and Hemopoiesis
Session 14 (Week 14)	Endocrine System
Session 15(Week 15)	Hormones
Session 16(Week 16)	The integumentary system
Session 17 (Week 17)	The Circulatory system
Session 18 (Week 18)	The Circulatory system
Session 19 (Week 19)	The Circulatory system
Session 20 (Week 20)	• Respiratory system
Session 21 (Week 21)	Respiratory system

Session 22 (Week 22)	Respiratory system
Session 23 (Week 23)	Digestive system
Session 24 (Week 24)	The urinary system
Session 25 (Week 25)	The urinary system
Session26(Week26- 27)	Reproductive system
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and

	relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪ ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle

	• Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex

Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney and Urine formation •Micturition •Renal failure •Male reproductive and Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland and Parathyriod Adernal gland and Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised..

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog
8	**Instruction Language**	English

9	Date of course approval	2022
Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.	
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985. • Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2* 28 = 56 teaching hours	
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.	
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be familiar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit.	

	• The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell
Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions

	Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.

Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**
Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.

Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	This course introduces medical technology students to the field of medical ethics. The objective of the course is:

	• To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner • Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide

	notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 4. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt;

	• Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others; • Learn to select, use, and critically analyze current HCMN research and literature; • Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology

	Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources
Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pathology

1	**Course name**	**Pathology**
2	**Course Code**	MT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022
Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences, plus investigation of those pathological mechanisms common to all tissue-cell pathology. Attention is paid to the processes of	

	cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Robbins & Cotran Pathologic Basis of Disease (Robbins Pathology) 10th Edition by Vinay Kumar MBBS MD FRCPath Abul K. Abbas MBBS , Jon C. Aster MD PhD 2020 • Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744. • Textbook of pathology by Harsh Mohan 6th edition, ISBN: 978-81-8448-702-2, 2010. • https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hpours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the common terms and definitions used in pathology • Identify of the nature of the disease, including its causes, growth patterns, and consequences • Recognizethe biological characteristics that distinguish each disease from the other. • The ability to distinguish the origin of the disease and how it develops The ability to distinguish the origin of the disease and how it develops •That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment •The student will infer the causes of disease and its growth patterns •The student determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Pathology gives explanations of a disease by studying the following four aspects of the disease 1. Aetiology 2. Pathogenesis

	3. Morphologic changes 4. Functional derangements and clinical significance •The causes of disease Environmental factors Genetic Factors
Session 2 (Week 2)	**Cell injury.** - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury (Reversible & Irreversible cell injury).
Session 3 (Week 3)	**Cell injury.** - Free radicals (sources, effects & destruction of FR). - Cell injury by chemicals and Cell injury by viruses.
Session 4(Week 4)	**Cell injury.** - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
Session 5 (Week 5)	• **Inflammation .** a. Acute inflammation & its types.
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	• **Repair and healing.**
Session 8 (Week 8)	• **Infectious diseases.** a. Bacterial, Viral, Fungal and Parasitic infection - a general outline b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis & Hydatid disease.
Session 9 (Week 9)	•**Immunopathology**. 1. Immune mechanism of tissue injury: a. Type I hypersensitivity. b. Type II hypersensitivity. c. Type III hypersensitivity. d. Type IV hypersensitivity. e. Tissue transplantation.
Session 10 (Week 10)	2. Autoimmune diseases: a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis. c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
Session 11(Week 11)	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
Session 12(Week 12)	• **Nutrition disorder.** Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• **Ionizing radiation**. a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• **Hemodynamic disorders** Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	**GENETIC DISORDERS** a. Single - Gene Defect "Mendalian Disorders" b. Disorders with Multifactorial Inheritance

Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• **Neoplasia.** - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	**Respiratory diseases.** Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	**Cardiovascular diseases .** - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28)	**Revision and discussion**
Session 22(Week29 - 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Dental Materials

1	**Course name**	**Dental Materials**
2	**Course Code**	DT203
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of various dental materials used in the market such as direct and indirect materials that used for restorations, e.g., filling, implants, fixed and removable prosthodontics and orthodontics. It will also help the students in understanding the basic procedures in mixing different materials used in the lab with the correct ratio in order to be able to chose correct material for each case.
Textbooks required for this Course:	• Richard Van Noort: Introduction to dental materials, Second edition, UK, 2003. • John F. McCabe and Angus W.G.Walls: Applied dental materials, Ninth edition, Blackwell Publishing Ltd, UK, 2008. • William J. O'Brien: Dental materials and their selection, Third edition, Quintessence Publishing Co, Inc, 2002. • Robert G.Craig, John M.Powers and John C. Wataha: Dental materials; properties and manipulation, Eighth edition, Mosby Inc, 2004. • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Project based learning (PBL), power point presentations, small Group interaction and discussion, active participation, Laboratory experiments; and videos (for some mechanical testing) , brain mapping and seminars.
Course Objectives:	Upon completion of this course, students should have ability to: • Understand the meaning of dental materials and its biocompatibility with the oral cavity and surrounding tissues. • Identify the different materials used in dentistry and the composition used for making each material, also the reason behind using more than only one material for restorations. • Recognize the properties of dental materials including physical, chemical, mechanical, optical, thermal, and rheological properties.

	• Identify representations, terms, conditions, and the concepts in mixing and pouring of the impression materials . • Recognize the different classifications of impression materials based on its rigidity e.g (gypsum products , zinc oxide eugenol) and flexibility (e.g Agar hydrocolloid, alginate hydrocolloid, silicon rubber, polysulfide, polyether) • Construct models made from gypsum products e.g, stone , plaster and modified/die stone. • Distinguish between materials that used in fixed and removable prosthodontics . • Write a report on the laboratory steps used in mixing the material with the correct ratio and the techniques used for mixing. • Develop a way to workout with the problems made in the restoration as a result of mixing the raw materials. • Implement devices used for sintering the porcelain particles for all ceramic restorations or for fusing porcelain on metal restoration.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to Dental Materials • Properties of Materials 1. Mechanical Properties 2. Physical Properties 3. Chemical Properties 4. Optical Properties 5. Rheological Properties
Session 2 (Week2 & 3)	• Gypsum products • Materials derived from gypsum 1. Models and dies 2. Impression materials 3.Moulds 4. Refractory investment • Types of Gypsum products 1. Model plaster 2. Dental stone 3. High strength dental stone (die stone) • Setting process / Sequence of setting process • Working and stetting time • Properties of gypsum products 1. Dimensional stability 2. Compressive strength 3. Tensile strength 4. Hardness and abrasion resistance Assignment 2 handed out
Session 3 (Week 4 &5)	• Impression materials • Requirements of impression materials • Classification of dental impression materials • Rigid impression materials

	1. dental compound 2. Impression plaster 3. Zinc oxide eugenol • Flexible impression materials 1. Alginate hydrocolloid -introduction into Alginate -Disadvantages of alginate -Uses of alginate -composition of alginate powder -properties of alginate -selection of Maxillary and mandibular trays
Session 4 (Week 6& 7)	• Flexible impression materials 2. Agar hydrocolloid -Introduction into Agar -composition of Agar -Agar impression trays and syringes -Ingredients of the gel and syringe materials -Properties of Agar 3. Elastomeric impression materials • Polysulfide impression materials -Composition of polysulfide -Classification of polysulfide -Setting reaction of polysulfide -Properties of polysulfide • Silicone impression materials -Development of silicone impression materials -Types of silicone -Properties of silicone • Polyether impression materials -Composition and setting reaction of polyether -Properties of polyether • Disinfection of elastomeric impressions • Elastomeric impression materials for bite registration
Session 5 (Week 8 &9)	• Mechanical properties I • Types of stresses • stress-strain curve •Elastic modulus •Elastic Moduli of Selected Dental Materials •Proportional Limit and Yield Strength •Yield strength of Selected Dental Materials •Ultimate Strength •Elongation and Compression •Resilience and Toughness •Hardness •Hardness of Selected Dental Surfaces
Session6(Week10&11)	• Mechanical properties II -Fracture toughness -Fatigue properties -Fatigue testing -Impact testing -Testing procedure
Session7(Week12&13)	•Physical properties

	A- Dimensional change and thermal conductivity -Introduction into dimensional change and definition -Dimensional change calculation -Thermal dimensional change -Thermal expansion -Coefficient of thermal expansion of dental materials -Clinical significance -Thermal conductivity -Thermal conductivity of dental materials
Session 8 (Week 14)	•Physical properties B- Electrical and optical -Galvanism and its occurrence - Solving galvanism problem -Corrosion -Ranking orders of electrode potential and reactivity for various metals -Galvanic corrosion -Dry corrosion -Wet corrosion -Consequence of corrosion -Tarnish
Session9(Week 15&16)	•Optical properties -Color - Factors affecting color -Parameters of color -Hue -Value -Chroma
Session10(Week17)	**Midterm Exam**
Session11(Week18&19)	•Chemical properties -Introduction into chemical properties -Absorption and adsorption -Degradation of polymer -Mechanism of degradation -Assessments of water sorption and soluble fraction of polymer -Comparison between polymers and composites in terms of water sorption -Clinical significance -Tarnish and corrosion of metals -Crevice corrosion -Degradation of ceramics
Session 12 (Week 21 &22)	•Rheological properties -Introduction into rheology -Viscosity -Application -Classification of fluid based on rheology -Newtonian fluid -Pseudoplastic fluid -Dilatant fluid -Plastic fluid -Clinical significance
Session 13 (Week 23 &24)	• Materials fir inlays, onlays , crowns and bridges -Introduction into terms

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	-Materials for indirect restoration -Uses of dental ceramics -Characteristics of Ceramics - Composition of Ceramics - Composition of dental porcelains -Types of Porcelain -Properties of Porcelains - Preparation of porcelains -Porcelain-Fused-to-Metal -Advantages and disadvantages
Session 14 (Week 25 & 26)	All ceramic restorations -CAD-CAM system -Uses for metals -Properties of metals -Forming Metal Objects -Alloys -Dental alloys requirements -Alloy composition -Gold alloys -Porcelain-Fused-to-Metal Alloys
Session15(Week27&28)	•Physical properties B- Electrical and optical -Galvanism and its occurrence - Solving galvanism problem -Corrosion -Ranking orders of electrode potential and reactivity for various metals -Galvanic corrosion -Dry corrosion -Wet corrosion -Consequence of corrosion -Tarnish
Session16(Week29-32)	**Practical Final Exam** **Theoretical and oral final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب . المقررات الدراسية للسنة الثالثة قسم تقنية الاسنان

Head and Neck Anatomy

1	**Course name**	**Head and Neck Anatomy**
2	**Course Code**	**DT301**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 credits
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Human Anatomy
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 2nd year, and this course will provide the students with a fundamental understanding of the nature of human body structures in general, and background about the anatomy of the head and neck In detailed.
Textbooks required for this Course:	• Essential in anatomy and physiology, ISBN-13: 978032191007 • Clinical anatomy by region, ISBN: 978-1-60913-446-Colour Atlas of Anatomy, ISBN: 9781582558561 • Principles of anatomy & physiology, ISBN: 978-1-118-34500-9 • Textbook of Head and Neck Anatomy 4th Edition by James L. Hiatt 2020. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, students should have ability to: • Understand human body structures and the head and neck anatomy and organs relationship. • Identify the parts and organs of the head and neck. • Recognize skull bones and foramen in addition the TMJ and cervical vertebra and joints with their movements. • Recognize blood vessels, brain and nerves, and respiratory and digestive organs. • Identify symbols, terms, conditions, and constructions • Construct basic knowledge about the head and neck anatomy. • Write brief descriptions of course topics • Develop students' time management skills. • Implement the anatomy knowledge in specialty subjects.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to anatomy
Session 2 (Week 2)	• Introduction to the skeletal system

	• Bones types & structure and Joints types and structure • Introduction to the muscular system (name and types of muscles)
Session 3 (Week 3)	• introduction to the cardiovascular system and lymphatic system • Heart and blood vessels circulatory routes • Lymph, lymph node and lymphatic duct
Session 4 (Week 4)	• Introduction to the nervous system (brain, spinal cord, and nerves) • Organization of the nervous system (central an peripheral)
Session 5 (Week 5)	• Introduction to the respiratory system (organs and organization) • Introduction to the digestive (organs and organization)
Session 6 (Week 6)	• Skull bones (Name, types and classification) • Cranial bones names, features and sutures
Session 7 (Week 7)	• Facial bones names, features and sutures • TMJ (articulation, type and movements allowed)
Session 8 (Week 8)	• Skull foramina and fissures and structures pass through each.
Session11(Week11)	• Cervical vertebra (typical and atypical cervical) • atlantoccipital and atlantoaxial joints (anatomy, type and movements allowed) • intervertebral joints anatomy and movements
Session12(Week 12)	• Nervous system of the head and neck • Cranial nerves (order, components and course) • Cranial nerve lesion reasons results.
Session 13 (Week 13)	• cervical segment of spinal cord • Spinal nerves roots and plexus • Cervical plexus (nerves, and roots)
Session 14 (Week14)	• Blood vessels of the head and neck. • Internal and external carotid branches and supplied areas. • Veins drained head and neck and the tributaries.
Session15(Week 15)	• Respiratory of the Head and neck • Nose, pharynx and larynx anatomy and anatomical position) • Paransal sinuses (names, function)
Session16(Week 16)	**Midterm exam (principle, practical, and oral)**
Session17(Week17- 19)	• Digestive of the head and neck. • oral cavity (parts names and boundaries) • salivary glands (names and anatomy)
	• Tongue (anatomy and description) • intrinsic and extrinsic tongue muscles • movements of tongue muscles and innervation
Session18(Week19- 20)	• Soft palate and hard palate structures. • innervation of Soft palate and hard palate
Session19(Week21&22)	• Facial expression muscles (origin, insertion, action, and nerve supply) • scalp layers and muscles.
Session20(Week23&24)	• Muscles of mastication (origin, insertion, action, and nerve supply)
Session21(Week25&26)	• Neck (identifying neck region) • Muscles of the neck * classification of neck muscles • attachments, actions and nerve supply of the neck muscles
Session 22 (Week 27)	• neck muscular triangles (anterior and posterior) • contents of neck triangles

Session 23 (Week 28)	Revision and discussion
Session24(Week29-32)	**Theoretical, oral and Practical final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues. - Work in group (team work) and Time management. - Give p.pt presentation. And Criticize his/her work. - Think critically to solve the problem may be faced during the work, Use the Internet for preparing scientific researches. - Write a report about the steps that implemented in the laboratory.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible.

Dental Anatomy

1	**Course name**	**Dental Anatomy**
2	**Course Code**	**DT302**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 Units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Human anatomy
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course is designed to familiarize the dental hygiene student with all phases of dental anatomy. Topics of study include gross anatomy, nomenclature, eruption sequence, morphology and physiology of the oral structures with emphasis on the primary and permanent dentitions, occlusion, an overview of the temporomandibular joint, and anomalies of the oral structures. The coronal structure and root	

	morphology for individual teeth will be addressed and related to direct patient care procedures.
Textbooks required for this Course:	• Dental Anatomy and Morphology 1st Edition by Hilton Riquieri 2019 • Textbook of Oral Anatomy, Physiology, Histology and Tooth Morphology by K. Rajkumar Kindle Edition 2011 • Textbook of Dental Anatomy, Physiology & Occlusionby Rashmi GS (Phulari) DOI: 10.5005/jp/books/11986 • Glasstone S (1967) Development of teeth in tissue culture. J. Dent. Res. 46: 858.Harris EF and JH McKee (1990) Tooth mineralization standards for blacks and whites from themiddle southern United States. JFSCA, 35:859-872 • Hershkovitz J, Moskona D, Arensberg B and E Kobyliansky (1987) Directional dental asymmetry inSouth Sinai Bedouin isolates. Anthropol. Anz. 45: 269-274. • Garn SM, Smith BH and RE Moyers (1981) Structured (patterned) dimensional and developmentaldental asymmetry. Proc. Finn. Dent. Soc. 77:33-36. • Dental Anatomy, its Relevance to Dentistry, Eighth edition. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire basic skills in Carving of crowns of permanent teeth in wax. • Expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different Pathological/non p pathological states. • Know the basic knowledge of various research methodologies
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Tooth Description..
Session 2 (Week 2)	Dental terminology...
Session 3 (Week 3)	Tooth numbering systems (Different system) (Dental formula).
Session 4 (Week 4)	Anatomical Structure (Landmarks)
Session 5 (Week 5)	Morphological of permanent teeth: Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth
Session 6 (Week 6)	Morphology of permanent maxillary incisors
Session 7 (Week 7)	Practical: Carving on wax blocks:-

	Individual tooth - Only permanent teeth of both arches, maxillary Central,lateral Incisors.
Session 8(Week 8)	Morphological of permanent mandibular incisors
Session 9 (Week 9)	Carving on wax blocks:- Individual tooth, mandibular Central, lateral Incisors
Session10(Week10)	Morphological of permanent maxillary canines.
Session11(Week11)	Carving on wax blocks:- Individual tooth, maxillary Canine
Session12(Week 12)	Morphological of permanent mandibular canines
Session13(Week 13)	Carving on wax blocks:- Individual tooth, mandibular Canine
Session14(Week14)	**Midterm Exam**
Session15(Week15)	• Morphological of permanent maxillary first premolar
Session16(Week16)	Carving on wax blocks:- Individual tooth, permanent maxillary first premolar
Session1 (Week17)	Morphological of permanent maxillary Second premolar
Session18(Week 18)	Carving on wax blocks:- Individual tooth, permanent maxillary Second premolar
Session19(Week19)	Morphological of permanent mandibular First premolar
Session20(Week20)	Carving on wax blocks:- Individual tooth, permanent mandibular first premolar
Session21(Week 21)	Morphological of permanent mandibular Second premolar
Session22(Week 22)	Carving on wax blocks:- Individual tooth, permanent mandibular second premolar
Session23(Week 23)	Morphological of permanent maxillary First molar
Session24(Week 24)	Carving on wax blocks:- Individual tooth, permanent maxillary first molar
Session25(Week 25)	Morphological of permanent maxillary second, third molar
Session26(Week 26)	Carving on wax blocks:- Individual tooth, permanent maxillary second ,third molar
Session27(Week 27)	Topics to be covered in the session (week) Morphological of permanent mandibular first, second, third molars
Session28(Week 28)	Carving on wax blocks:- Individual tooth, permanent mandibular first, second, third molar
Session29(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing

	needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Removable Prosthodontic I

1	**Course name**	**Removable Prosthodontic I**
2	**Course Code**	**DT303**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4
5	**Educational hours**	**6** hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 3rd year and, the course will provide the students with the understanding of various processing steps used during fabrication of complete denture setting of the such as fabrication of the especial tray, occlusion rims teeth, etc.
Textbooks required for this Course:	• Phillips' Science of Dental Materials by hiayi Shen, H. Ralph Rawls, Josephine Esquivel-Upshaw13th Edition - May 13, 2021 • McCracken's Removable Partial Prosthodontics by Alan Carr, David Brown 13th Edition - November 3, 2015 • http://www-personal.umich.edu/~sbayne/dental-materials/RPD- - Acrylic-HO.pdf- • (http://www.fotosearch.com/photos images/dentures.html). • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Lecture- practice lectures – educational videos –training – collect information from libraries and internet - based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the students should have the ability to: • Understand the concept of occlusion and how to use it in complete denture and how to repair it. • Identify the different parts of complete denture. • Identify representations, terms, conditions.

	• Clarify the importance of provisional denture and the techniques used to fabricate complete denture. • Recognize the different techniques and methods for reparing , repasing, reline and dublication of complete denture. • Distinguish the indications to the various complete denture. • Understand various processing steps used during fabrication of complete denture. • Identify basic principles of tooth selection and arrangement. • Write a report about the steps that implemented in the laboratory.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction of complete denture
Session 2 (Week 2)	Fabrication of special tray
Session 3 (Week 3)	Materials used to fabricate of special tray
Session 4 (Week 4)	Impression and types of it.
Session 5 (Week 5)	Impression materials
Session 6 (Week 6)	- Relief
Session 7 (Week 7)	- Posterior palatal seal (post-dam)
Session 8 (Week 8)	- Face bow
Session 9 (Week 9)	-Articulator
Session 10 (Week 10)	-classification of articulator
Session 11 (Week 11)	- record base
Session 12 (Week 12)	- Occlusal block
Session 14 (Week 13)	Teeth selection
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	Setting of upper anterior teeth-
Session 16 (Week 16)	-Setting of lower anterior teeth
Session 17 (Week 17)	-Setting of upper posterior teeth.
Session 18 (Week 18)	-Types of the posterior teeth
Session 19 (Week 19)	-Wax up
Session 20 (Week 20)	Flasking •
Session 21 (Week 21)	- Finishing of final stage
Session 22 (Week 22)	-polishing of final stage
Session 23 (week 23)	Topics to be covered in the session (week) - Complete denture error
Session 24 (week 24)	- Repair
Session 25 (week 25)	- Rebase

Session 26 (week 26)	- Reline
Session 27 (week 27)	- Duplication of denture
Session 28 (week 28)	- Students Presentations
Session 29 (week 29)	Revision and discussion
Session 30 (Week 31)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Fixed Prosthodontics I (Crowns and Bridges)

1	**Course name**	**Fixed Prosthodontics I (Crowns and Bridges)**
2	**Course Code**	DT304
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course is designed to the undergraduate students at the 3rd year and, the course will provide the students with the understanding of various processing steps used during fabrication of fixed prosthesis such as fabrication of the working cast, working cast waxing, etc.

Textbooks required for this Course:	• Fundamentals' of fixed prosthodontics. 3rd edition Herbert T. Shillingburg , 2022 • Fundamentals of Fixed Prosthodontics Fourth Edition by Herbert T. Shillingburg, Jr,DDS • https://books-library.net/files/download-pdf-ebooks.org-1519394600lu5G8.pdf • Contemporary Fixed Prosthodontics by Stephen F. Rosenstiel, Martin F. Land, Robert Walter 6th Edition - June 22, 2022 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Presentation's Lectures, small discussion Groups, seminars, project based learning (PBL), videos, practical (laboratory).
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the concept of occlusion and how to use it in fixed prosthodontics • Identify the different parts of fixed partial denture. • Identify representations, terms, conditions, • Recognize different classifications of fixed structures. • Clarify the importance of provisional restorations and the techniques used to fabricate temporary restorations. • Construct the temporary restorations. • Recognize the different techniques and methods for working cast and die. • Develop wax patterns for anterior and posterior teeth (crowns and bridges). • Distinguish the indications to the various fixed prostheses such as crowns, bridges and inlays and onlays • Understand various processing steps used during fabrication of fixed restorations. • Identify basic principles of tooth preparation provide the students with the, waxing, • Write a report about the steps that implemented in the laboratory.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to Fixed prosthodontics. • Scope of fixed prosthodontics • Indications and contra-indications of different types fixed restorations • Types of fixed prosthodontics restorations. • Terminology of fixed prosthodontics. • Component of fixed partial bridge.

Session 2 (Week 2)	• Conventional fixed prosthesis. • Materials used for fixed restoration • Techniques used for constructing fixed prosthesis. • Steps in construction of cast restorations. • Types of fixed restorations and their classifications. • Contra-indications of partial coverage restorations. Assignment 2 handed out
Session 3 (Week 3)	• Conventional fixed prosthesis II • Fixed partial denture. • A primary abutments. • An intermediate abutments • Classification of fixed partial denture. • According to retention • Advantages, disadvantages, Indication, and contra-indication for different types of bridges.
Session 4 (Week 4)	• Conventional fixed prosthesis III • Classification of FPD : • According to materials • According to location
Session 5 (Week 5)	• Principles of tooth preparation. • Definition of tooth preparation and prepared teeth. • Purpose of tooth preparation. • Biomechanical principles of tooth preparation for a cast metal or porcelain restorations. 1- Preservation of tooth structure. The results of excessive reduction of tooth structure during tooth preparation.
Session 6 (Week 6)	• Biomechanical principles of tooth preparation for a cast metal or porcelain restorations: 2- Retention and resistance from. • Path of insertion • Factors affecting the resistance form i. Taper ii. Surface area • Factors affecting surface area iii. Length and height. iv. Texture of preparation. v. Accessory means
Session 7 (Week 7)	3. Structural Durability (Preventing Deformation) • Preparation Features Related to Structural Durability: a- Occlusion reduction. b- Axial reduction.

	c- Functional cusp bevel. • Inadequate functional cusp bevel may produce several problems. 4. Preservation of Periodontal Tissue. • Finish line. • Requirement of finish line. • Classification of finish line according to location
Session 8 (Week 8)	5 - Marginal Integrity. • The Requirements of Restoration Margins • Types of finish lines • Chamfer finish line • Knife edge finish-line. • Shoulder finish line. • Shoulder with bevel. • Chamfer with bevel. • Advantages, disadvantages of each type.
Session 9 (Week 9)	PBL Assessment (Project Based Learning)
Session 10 (Week 10)	• Working (Master) Cast • Requirements of good Cast. • Before pouring the cast. • Pouring the cast. • Separating, Trimming, and Storing Casts.
Session 11 (Week 11)	• Provisional (Interim) Restoration. • Requirements of Provisional Restoration.
Session 12 (Week 12)	• Types of temporary crowns. • Techniques used for fabricating custom temporary restoration. • Advantages of indirect over direct technique • Cementing of the Temporary Crown or Bridge
Session 13(Week 13)	• Methods of Fabricating Custom Provisional Restoration. 1. Vacuum-Forming Methods. 2. Alternative Methods. a. Alginate Impression Template Method. b. Silicone Template Method
Session 14 (Week 14)	• The Die: • Ideal requirements of die • Requirements of die materials. • Types of die according to material used. 1. Gypsum products. 2. Resin dies or epoxy dies. 3. Amalgam dies. 4. Refractory die. 5. Electroplated die.

	I. Silver-plated die. II. Copper-plated die. 1. Gypsum products die. • Types of dental gypsum products • Advantages and disadvantages of gypsum products
Session 15 (Week 15)	**Midterm exam**
	• Properties of Gypsum Products. a. Strength: i. Crush strength ii. Wet strength iii. Dry strength. b. Setting time. i. Initial sitting time ii. Final sitting time. c. Setting expansion. i. Normal sitting expansion. ii. Hygroscopic sitting expansion. iii. Thermal sitting expansion.
Session16(Week16-18)	• Effect of Selected Variables on Crushing Strength. 1. Water-powder ratio 2. Mechanical mixing. 3. Chemical modifiers. • Effect of Selected Variables on Setting Time. 1. Water –powder ratio. 2. Water temperature. 3. Mixing. • Accelerator and retarders. • Effect of Water-Powder Ratio and Mixing Time on Setting Expansion
Session17(Week 19-20)	2. Resin dies or epoxy dies. • Advantages and disadvantages 3. Amalgam dies. • Advantages and disadvantages 4. Refractory die. 5. Electroplated die. • Advantages and disadvantages. • The Working Cast & Die Systems. 1- Working cast with separated die. ○ Advantages. ○ Disadvantages. ○ Procedures. 2- Working cast with removable die.

Session18(Week 21-22)	2. Working Cast with a Removable Die. ○ The Main Requirement of Working Cast with a Removable Die. ○ Advantages. ○ Disadvantages. • Techniques of Removable Die. 1- Dowel pin Technique. a- Single Dowel (Flat or Curved Single dowel pin). b- Double Dowel. 2- Pindex System. 3- Di-lock Technique. • Steps of fabrication.
Session 19(Week 23 -24)	• Wax pattern ○ Requirement of casting wax. • Techniques of a wax pattern. • Types of Waxes that used for Wax Pattern. 1- Type I waxes: are formulated for making intraoral (inlay) wax patterns. 2- 1- Type II waxes: are formulated for making wax pattern indirectly. • Methods of Wax Pattern Construction. 1. Dipping Method. 2. Addition Method. 3. Molten Press Method. 4. Injection Method.
Session 20 (Week 25-26)	• Die or Cast preparation Before Wax Pattern ○ Trimming the Die. ○ Shaping the die Handle. ○ Correction of Defects. ○ Marking the Margin. ○ Paint on the Die Spacer.
Session 21(Week 27-28)	• Waxing Instruments ○ No 1: wax large addition instruments ○ No 2: wax lesser addition instruments. ○ No 3: burnisher for refining occlusal anatomy. ○ No 4: wax carvers ○ No 5: wax carvers. ○ No 6: wax burnisher. ○ No 7: waxing spatula for fundamental layer. • Steps of Waxing a Pattern. • The techniques for occlusal and axial contouring of wax patterns are:

	1. Negative waxing, which is the buildup, smash, and carve technique. 2. Positive waxing, which consists of adding wax to a wax blank
Session 22 (Week 28)	**Practical final exam**
Session 23 (Week 29-32)	**Theoretical and oral Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues. - Work in group (team work). - Time management. - Give p.pt presentation. - Implement of dental laboratory instruments and devices. - Write a report about the steps that implemented in the laboratory. - Use the Internet for preparing scientific researches. - Criticize his/her work. - Think critically to solve the problem may be faced during the work.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Oral pathology

1	**Course name**	**Oral pathology**
2	**Course Code**	DT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hors per week
6	**Pre-requisite requirements**	Pathology
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of oral pathology in a complete simplified way. Oral pathology course gives examples of oral disease and those lesions in the wide range of systemic disorders that have oral manifestations.
Textbooks required for this Course:	• Oral pathology for the dental hygienist, fourth edition, ibsen, phelan. united state of America, 2004. • Shafer's Textbook of Oral Pathology, 6/e by B Sivapathasundharam, Arya Rajendran 6th Edition - July 15, 2009 • Textbook of Oral Pathology by Anil Govindrao Ghom 2nd Edition 2013. • A Textbook of Oral Pathology by William G. Shafer BS DDS MS (1983-01-01) • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, project based learning (PBL), videos, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the stages of disease formation, its nature and causes • Identify the students on the most important diseases the effect the oral tissue • Recognize the types of dental caries. • Identify representations, terms, conditions that used in oral pathology

	• Recognize different abnormality of the teeth. • Write the stages of plaque formation. • Implement a diagnoses about the disease by using special instruments.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to principle of pathology • Types of the cells • Cellular adaptations to stress Overview of cell injury and cell death • Causes of cell injury
Session 2 (Week 2)	• Inflammation • Causes of inflammation • Types of inflammation • Acute inflammation • Chronic inflammation • complications Assignment 2 handed out
Session 3 (Week 3)	Repair Definition Factors affecting repair Local factors General factors • Types of repairs
Session 4 (Week 4)	Cell response to injury Causes of cell injury Mechanism of cell injury Effects of cell injury • Pathological features
Session 5 (Week 5)	Necrosis Definition Causes and pathogenesis Types of necrosis
Session 6 (Week 6)	Apoptosis Definition Morphological changes Occurrence
Session 7 (Week 7)	• Infectious diseases • Bacterial infections • Definition • Mode of infection • Exogenous infection • Endogenous infection
Session 8 (Week 8)	• Fungal infections Viral infections

	Mode of infection Mechanisms of cell injury by viruses • Pathological changes
Session 9 (Week 9)	**PBL assessment (project based learning)**
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	Disturbances of growth Atrophy Hypertrophy Hyperplasia Metaplasia • Dysplasia
Session 12 (Week 12)	Tumours Definition General characters of tumours Benign tumours • Malignant tumours
Session 13 (Week 13)	• dental caries • definition of dental caries Theories for dental caries Hypothesis for etiology of dental caries • Role of saliva
Session 14 (Week 14)	• Classification of dental caries • G.V. BLACK Who system
Session 15 (Week 15)	• dental plaque • Definition of Dental plaque Bacterial Lifestyles • Formation of Dental Plaque Biofilm
Session 16 (Week 16)	**Midterm practical Exam**
Session 17 (Week 17)	• GINGIVITIS Clinical Features Gingival Bleeding iv. Histopathological changes associated with gingivitis
Session 18 (Week 18)	• PERIODONTITIS • Factors involved in the severity of periodontitis Classification of periodontitis • Periodontitis Association With Endodontic Lesion
Session 19 (Week 19)	abnormalities of teeth Alterations in shape Gemination Fusion Concrescence Dilacerations Dens invaginatus
Session 20 (Week 20)	abnormalities of teeth Alterations in shape

	Dens evaginatus Taurodontism Supernumerary roots Enamel pearls Attrition Abrasion • Erosion
Session 21 (Week 21)	abnormalities of teeth Alterations in size microdontia 5. macrodontia
Session 22 (Week 22)	abnormalities of teeth Alterations in number Anodontia Impaction ○ Supernumerary teeth
Session 23 (Week 23)	Pulp calcification Abnormalities of dental pulp Internal resorption External resorption
Session 24 (Week 24)	Neoplasia Objectives description Causes of neoplasia
Session 25 (Week 25)	Immunity Objectives Immune response Antigens Cells involved in the immune response
Session 26 (Week 26)	Diseases affecting the temporomandibular joint Anatomy of the tempromandibular joint Normal joint function Temporomandibular disorders
Session 27 (Week 27)	histopathological techniques steps of histopathology Tissue processing Microtomy Types of microtomes
Session 28 (Week 28)	Revision and discussion
Session 28 (Week 29)	**Practical final exam**
Session29(Week30-32)	**Theoretical and oral final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues.

	- Work in group (team work). - Time management. - Give p.pt presentation. - Implement of dental laboratory instruments and devices. - Write a report about the steps that implemented in the laboratory. - Use the Internet for preparing scientific researches. Criticize his/her work. Think critically to solve the problem may be faced during the work.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Oral Microbiology

1	**Course name**	**Oral Microbiology**
2	**Course Code**	**DT306**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 Units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General Microbiology
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 3rd year and, this course introduces dental technology students to oral microbiology. The basic principles of microbiology are presented in this course, with an emphasis on the relevance of these principles to human oral health. Diseases of microbial origin that concern the dental hygienist are presented to illustrate the principles of pathogenesis, host-parasite interaction, and modes of transmission. Infection control in a dental environment is emphasized.
Textbooks required for this Course:	• Oral microbiology by Philip D Marsh& Micheal V Martin • Oral Microbiology by Philip Marsh, Michael Lewis, Helen Rogers, David Williams, Melanie Wilson 6th Edition - May 13, 2016 • Clinical Oral Microbiology by T. Wallace MacFarlane and Lakshman P. Samaranayake 1989.

	• Brock Biology of Microorganisms by Michael T. Madigan, Kelly S. Bender, Daniel H. Buckley, W. Matthew Sattley and David A. Stahl 15th edition 2018 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Presentation's Lectures, small discussion Groups, seminars, project based learning (PBL), videos, practical (laboratory).
Course Objectives:	Upon completion of this course, students should be able to: • Appreciate the diversity and complex microbial interactions within the oral microbiome and understand how the oral microbiota is shaped. • Understand the major characteristics of supragingival and subgingival biofilms. • Understand the innate and adaptive immune responses in the oral cavity. • Understand the mechanisms utilized by bacteria to colonize the different niches in the oral cavity. • Identify and describe the major characteristics of bacterial, fungal and viral pathogens associated with disease. • Recognize the multifactorial aspects of dental caries and periodontitis. • Recognize the possible associations of oral bacteria with systemic infections and cancer. • Know the available options for treatment and prevention of oral infections, recognize the benefits and limitations of the current therapeutic approaches, and identify areas for future research in this area..
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to general microbiology. • Microbes • Key figures in the history of microbiology • Types of Cells. • Membrane bound organelles are found in eukaryotic cells.
Session 2 (Week 2)	• Transport. • Taxonomy of microbiology . • The Prokaryotes (Kingdom Monera). • The Kingdom Protista. homework 1 handed out plus quiz 1
Session 3 (Week 3)	• The Kingdom Fungi • The Kingdom Plantae . • The Kingdom Animalia. homework 2 handed out plus quiz 2
Session 4 (Week 4)	• Viruses • Growth and culture of bacteria.

	• Identifying bacterial species • Eukaryotic organisms that cause human disease – parasitic disease homework 3 handed out plus quiz 3
Session 5 (Week 5)	• Definition of oral microflora . • Microbial habitats. • Factors affecting growth of oral microflora. • Identification the different types of bacteria in the mouth. • Important oral bacteria. homework 4 handed out plus quiz 4.
Session 6 (Week 6)	• Clinical examples of microbes in the mouth. • Flora in dental plaque. • Changes in the oral flora with age . • Bacterial endocarditis . homework 5 handed out plus quiz 5.
Session 7 (Week 7)	• . Dental plaque • Macroscopic Structure and Composition of Dental Plaque: • Materia alba. • Calculus. • Supragingival plaque. • Subgingival plaque • Organic constituents of the matrix of dental plaque. homework 6 handed out plus quiz 6.
Session 8 (Week 8)	5 – Dental plapue. • The Inorganic Component of dental plaque. • Formation of Dental Plaque. a) Formation of the pellicle coating on the tooth b) surface. c) Initial colonization by bacteria, and d) Secondary colonization and plaque maturation. homework 7 handed out plus quiz 7
Session 9 (Week 9)	**Revision and discussion**
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	• Host-parasite relationship. • Mutualism. • Parasitism. • Pathogenicity quiz 8
Session 12 (Week 12 &13)	• Opportunistic pathogens. • Infection. • Virulence • Host defenses. • Inducible defenses. • Antigens • Natural antibodies • Antimicrobial agents • Host factors.

	homework 9 handed out plus quiz 9
Session 13 (Week 14 &15)	• Oral immunity • Homeostasis and Immune System • Language of the Immune System • Key Elements of Immunity • Three Important Characteristics to Adaptive Immunity • Immunogens and Antigens. homework 10 handed out plus quiz 10
Session 14 (Week 16 & 17)	• Five Classes [subclasses] of • Immunoglobulins • Blood Leukocytes • Granulocytes • Monocytes - Macrophages • Lymphocytes • Maturity of T and B Cells. homework 11 handed out plus quiz 11
Session 15 (Week 18)	**Midterm practical exam**
Session 16 (Week 19)	• Types of Hypersensitivity Reactions • Progression of the Inflammatory Periodontal Lesion • Initial Lesion (2-4 days) • Early Lesion (4-7 days)
Session 17 (Week 20)	Topics to be covered in the session (week). • Infectious Diseases. Bacterial Infections 1. Impetigo 2. Tonsillitis and Pharyngitis 3. Tuberculosis 4. Actinomycosis 5. Syphilis
Session 18 (Week 21)	Infectious Diseases. • Bacterial Infections 6. Necrotizing Ulcerative Gingivits 7. Pericoronitis 8. Acute Osteomyelitis 9. Chronic Osteomyelitis
Session 19 (Week 22)	Topics to be covered in the session (week). • Infectious Diseases. Fungal Infections 1. Candidiasis 2. Deep fungal infections 3. Mucormycosisb- Double Dowel.
Session 20 (Week 23)	Topics to be covered in the session (week). • Infectious Diseases Viral Infections. 1. Human Papillomavirus Infection

	2. Herpes Simplex Infection
Session 21 (Week 24 &25)	• Infectious Diseases Viral Infections. 3. Varicella-Zoster Virus 4. Epstein-Barr Virus 5. Coxsackievirus Infections
Session 22 (Week 26)	• Hand-Foot-and-Mouth Disease • Acute Lymphonodular Pharyngitis • Other Viral Infections That May Have Oral Manifestations.
Session 23 (Week 27)	**Practical final exam**
Session 26 (Week 28)	**Theoretical and oral Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues. - Work in group (team work). - Time management. - Give p.pt presentation. - Implement of dental laboratory instruments and devices. - Write a report about the steps that implemented in the laboratory. - Use the Internet for preparing scientific researches. - Criticize his/her work. - Think critically to solve the problem may be faced during the work.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pharmacology

1	**Course name**	**Pharmacology**
2	**Course Code**	**MT306**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Dental Technology
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide how a drug affects a biological system and how the body responds to the drug. The discipline encompasses the sources, chemical properties, biological effects and therapeutic uses of drugs.
Textbooks required for this Course:	• Essential of general pharmacology book.Lippincott's Illustrated Reviews: pharmacology book.Pharmacology and drug administration for imaging technology book. • Basic Pharmacology Understanding Drug Actions and Reactions By Maria A. Hernandez,., Appu Rathinavelu, 1st edition 2006. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor. • A Textbook of Clinical Pharmacology and Therapeutics, 5th By James Ritter, Lionel Lewis, Timothy Mant, Albert Ferro 2008 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	One academic year
Delivery	Lecture-based.Group interaction and discussion. self-directed activities. Active participation.

Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire new knowledge in pharmacology by conducting and promoting innovative research. • Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs. • Report the clinical applications, side effects of drugs used in medicine. • Translate pharmacological principles into clinical decision making.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	B. General pharmacology: • Introduction. • Drug sources. • Routes of drug administration. • Pharmacokinetics.
Session 2 (Week 2)	C. General pharmacology: • Pharmacodynamics. • Drug adverse effects and toxicity. • Drug-drug interactions.
Session 3 (Week3)	D. Autonomic nervous system: • Introduction. • Sympathomimetics. • Sympathetic depressants.
Session 4 (Week4)	B. Autonomic nervous system: • Parasympathomimetics. • Parasympathetics depressants.
Session 5 (Week5)	B. Autonomic nervous system: • Drug acting on autonomic ganglia. • Skeletal muscle relaxants. • Drug acting on the eye.
Session 6 (Week 6	C. Autacoids: • Histamine & serotonine. • Prostaglandins & eicosanoids. • Vasoactive peptides.
Session7 (Week 7)	D. Central nervous system: • Introduction. • Sedative & hypnotics.
Session8 (Week 8)	D. Central nervous system: • Analgesics and antipyretics & NSAID. • Narcotic analgesics. • Anticonvulsants & antiepileptics

Session9 (Week 9)	D. Central nervous system: • Antiparkinsonian drugs. • Antipsychotics and antianxiety & antidepressants. • Local & general Anaesthetic.
Session10 (Week 10)	E. Cardiovascular system: • Antihypertensive & antishock drugs. • Cardiac glycosides and congestive heart failure. • Antiarhythemic drugs. • Drugs used in angina pectoris.
Session 11 (Week 11)	Topics to be covered in the session (week12) F. Blood: 1. Coagulants, anticoagulants, fibrinolytics & antiplatelets. 2. Drugs used in treatment of anemia. 3. Drugs used in treatment of hyperlipidemia.
Session 12(Week 12)	G. Chemotherapy: • Sulphonamides & quinolones. • B-lactum antibiotics (penicilins, cephalosporins).
Session 13 (Week 13)	G. Chemotherapy: • Chloramphenicol & tetracyclines. • Aminoglucosides antibiotics. • Antifungal drugs
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	G. Chemotherapy: Antiviral drugs, Antituberculus, Antimalarial drugs & antiprotozal.
Session 16 (Week 16)	H. Endocrie drugs: Antidiabetics drugs and Antithyroid drugs.
Session17 (Week 17)	H. Endocrie drugs: • Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).
Session 18 (Week 18)	H. Endocrie drugs: • Corticosteroids. • Sex hormones, contraceptives drugs.
Session 19 (Week 19)	I. Respiratory system: • Drugs used in treatment of bronchial asthma.
Session 20 (Week 20)	I. Respiratory system: • Cough therapy. * Gas therapy
Session 21(Week 21)	J. GIT: • Drugs used in treatment of peptic ulcer. • Antiemetic drugs.
Session22(Week22-23)	J. GIT: • Drugs used in treatment of constipation and diarrhea. • Antispasmodics.
Session23(Week23-28)	K. Urinary tract: 1. Diuretics. 2. Urinary tract infection.
Session24(Week29)	Revision and discussion
Session25(Week 30)	**Final exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers.

	• Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications. • http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research

	• General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem • Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper

	• guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling • Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Oral Histology

1	**Course name**	**Oral Histology**
2	**Course Code**	DT309
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Biology/Histology
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of oral histology in a complete simplified way. Oral histology course provide dental students with a better understanding of the cellular components of the oral hard and soft tissues, supplying a scientific basis upon which clinical decisions for dental treatment can be made
Textbooks required for this Course:	• Essentials of oral biology, first edition, maji jose. india, 2010. • Essentials of Oral Histology and EmbryologyA Clinical Approach by Daniel Chiego 5th Edition - January 7, 2018 • Fundamentals of Oral Histology and Physiology by Arthur R. Hand, Marion E. Frank 2015 • Textbook of Dental and Oral Histology with Embryology and Multiple Choice Questions by Satish Chandra, Shaleen Chandra, Girish Chandra, Mithilesh Chandra, Nidhee Chandra 2010, DOI: 10.5005/jp/books/10905 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments and apply lecture material during the laboratory session while completing the assignment using the virtual microscope, Histology Atlas located on your external hard drive, and lecture slides
Course Objectives:	Upon completion of this course, the students should have the ability to: • Understand the e functional and microscopic organization of normal human tissue and the development of the face and oral cavity • Identify the Cell Structure and Basic Tissues, Histology of Organ Systems and Histology of the Face and Oral Cavity • Recognize the four basic body tissues of the oral cavity, teeth and supporting tissues.

	• Identify representations, terms, conditions that used in oral histology • Recognize the structural similarities and differences between the cells/tissues/organs studied in the course. • Explain a foundation for the study of physiological function, pharmacological effects and pathological alterations of the human body. • Implement a e histological structure of the human body and understand how this relates to function and the relationship to gross anatomy.
Course Assessments	Midterm exam 20% activities: 10% Attendances 10% Final Exam: 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	General embryology Development of orofacial structures • Formation of face
Session 2 (Week 2)	• Histology Course Orientation Cell Structures and Functions • basic Types of the body tissues
Session 3 (Week 3)	Epithelium tissue Types of Epithelium tissue Characteristics of epithelial tissues Function of epithelial tissues
Session 4 (Week 4)	Connective Tissue Types of Connective tissue Characteristics of Connective tissues Function of Connective tissues
Session 5 (Week 5)	Nerve Tissue Types of Nerve tissue Characteristics of Nerve tissues Function of Nerve tissues
Session 6 (Week 6)	Muscle Tissue Types of Muscle tissue Characteristics Muscle tissues Function of Muscle tissues
Session 7 (Week 7)	Development of tooth Dental lamina Stages of development of tooth Morphological stages • Physiological stages
Session 8 (Week 8)	introductin • Enamel and amelogenesis • Characteristic features of enamel
Session 9 (Week 9)	Topics to be covered in the session (week) • Physical properties of enamel • Chemical composition of enamel Structure of enamel
Session 10 (Week 10)	**PBL assessment (project based learning)**
Session 11 (Week 11)	**Midterm exam**
Session 12 (Week 12)	• dentin and dentinogenesis

	• Characteristic features of dentin
Session 13 (Week 13)	Topics to be covered in the session (week) • Physical properties of dentin • Chemical composition of dentin Microscopic Structure of dentin
Session 14 (Week 14)	• pulp Morphological characteristic of pulp Coronal pulp Radicular pulp Apical foramen
Session 14 (Week 14)	Zones of pulp Structure of pulp Functions of pulp Age changes
Session 15 (Week 15)	**Midterm practical exam**
Session 16 (Week 16)	• cementum and cementogenesis • Physical properties • Chemical composition Types of cementum
Session 17 (Week 17)	Structure of cementum Primary acellular cementum Secondary cellular cementum Differences between acellular and cellular Functions of pulp cementum
Session 18 (Week 18)	• periodontal ligament Components of periodontal ligament development microscopic structure of periodontal ligament
Session 19 (Week 19)	Structure of periodontal ligament Cellular components Extracellular component • Functions of periodontal ligament
Session 20 (Week 20)	• alveolar bone Structure of alveolar bone Parts of the alveolar bone, Development
Session 21 (Week 21)	Chemical composition Bone histology , Cells of bone, Bone remodeling
Session 22 (Week 22)	Oral mucosa Function of oral mucosa Classification of oral mucosa Structure of oral mucosa
Session 23 (Week 23)	Salivary glands Classification of salivary glands Gross morphology, Microscopic structure
Session 24 (Week 24)	temporomandibular joint anatomy and histology of TMJ ligaments of TMJ, movements of TMJ
Session 25 (Week 25)	Maxillary sinus Anatomy of maxillary sinus Microscopic features of maxillary sinus
Session 26 (Week 26)	histopathological techniques

	steps of histopathology Tissue processing, Microtomy,Types of microtomes
Session 27 (Week 27)	Revision and discussion
Session 28 (Week 28)	**Practical Final Exam**
Session 29(Week 29-32)	**Theoretical and oral final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج . المقررات الدراسية للسنة الرابعة قسم تقنية الاسنان

Removable Prosthodontic II

1	**Course name**	**Removable prosthodontic II**
2	**Course Code**	DT401
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	4
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Removable Prosthodontic I
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 4th year, and this course will provide the students with the necessary theoretical background that includes explanations all the typesof removable partial denture , indication , contraindication, the laboratory steps of fabricating .....etc
Textbooks required for this Course:	• Phillips' Science of Dental Materials by hiayi Shen, H. Ralph Rawls, Josephine Esquivel-Upshaw13th Edition - May 13, 2021 • McCracken's Removable Partial Prosthodontics by Alan Carr, David Brown 13th Edition - November 3, 2015 • http://www-personal.umich.edu/~sbayne/dental-materials/RPD- - Acrylic-HO.pdf- • (http://www.fotosearch.com/photos images/dentures.html). • http://www-personal.umich.edu/~sbayne/dental-materials/RPD- - Acrylic-HO.pdf- • http://www.fotosearch.com/photos-images/dentures.html. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture- practice lectures – educational videos –training – collect information from libraries and internet - based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course students should have the ability to: • Understand the various processing steps used during fabrication of partial denture. • Identify various materials used in fabrication. • Recognize the theoretical background of different partial dentures.

	• Identify the different steps of constructing different partial prosthesis. • Construct interim denture and flexible denture. • Implement a dental laboratory instruments and devices professionally.
Course Assessments	Assignment 1: PBL (Report, p.pt presentation, Model) 15% Midterm: Theoretical Midterm 10%, practical midterm 10 %, Daily Assessments: Homework and Quizzes 5 % Final Exam: Theoretical 30%, Practical 30% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	- Introduction of removable partial denture (RPD)
Session 2 (Week 2)	- RPD component of Chromium cobalt
Session 3 (Week 3)	- Major connector.
Session 4 (Week 4)	-maxillary major connector.
Session 5 (Week 5)	-Mandibular major connector-
Session 6(Week 6)	- types of minor connector
Session 7 (Week 7)	-fabrication of minor connector
Session 8(Week 8)	- Rest
Session 9 (Week 9)	-Types of Rest
Session 10 (Week 10)	-Rest seat
Session 11 (Week 11)	**Midterm Exam**
Session 12 (Week 12)	-Types of rest seat
Session 13 (Week 13)	-Direct retainer for class I , II -Direct retainer for class III , IV
Session 14 (Week 14)	-indirect retainer
Session 15 (Week 15)	-types of indirect retainer
Session 16 (Week 16)	- dental surveyor
Session 17 (Week 17)	- Types of dental surveyor
Session 18 (Week 18)	**Midterm practical exam**
Session 19 (Week 19)	- uses of dental surveyor
Session 20 (Week 20)	- objectives of dental surveyor
Session 21 (week 21)	- tooth selection
Session 22 (week 22)	- types of Denture base
Session 23 (week 23)	- RPD component of acrylic resin
Session 24 (week 24)	- RPD acrylic resin fabrication
Session 25 (week 25)	- Interim partial denture

Session 26 (week 26)	- Flexible denture
Session 27 (week 27)	- repair of partial denture.
Session 28 (week 28)	Revision and discussion
Session29(Week29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Fixed Prosthodontics II (Crowns and Bridges)

1	**Course name**	**Fixed Prosthodontics II (Crowns and Bridges II)**
2	**Course Code**	**DT402**
3	**Course type: general/specialty/optional**	Specialty
4	**Accredited units**	4 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Fixed Prosthodontics I (Crowns and Bridges I)
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 4th year, and this course will provide the students with the necessary theoretical background that includes explanations the laboratory steps of fabricating metal restoration, metal ceramic system, all ceramic restoration, CAD/CAM, and dental implants.
Textbooks required for this Course:	• Fundamentals' of fixed prosthodontics. Herbert T. Shillingburg , et.al. 4th edition

	• Contemporary Fixed Prosthodontics. Stephen F. Rosenstiel, et al. 5th edition • Fundamentals' of fixed prosthodontics. 3rd edition Herbert T. Shillingburg , 2022 • Fundamentals of Fixed Prosthodontics Fourth Edition by Herbert T. Shillingburg, Jr,DDS • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Presentation's Lectures, small discussion Groups, seminars, project based learning (PBL), videos, practical (laboratory).
Course Objectives:	Upon completion of this course student should have the ability to: • Understand the various processing steps used during fabrication of fixed prosthesis such as spruing, Investing and casting. • Identify the various materials used in different laboratory steps • Perform the casting, finishing, and polishing. • Recognize the theoretical background of pontic design and the different types of pontics and indications • Identify the different steps of constructing different fixed prosthesis. • Recognize different types and classification of sprue formers and the ideal area for attaching in the wax pattern. • Construct a metal ceramic restoration. • Write a report about the steps that implemented in the laboratory. • Develop students' time management skills. • Implement a dental laboratory instruments and devices professionally.
Course Assessments	**Assignment 1**: PBL (Report, p.pt presentation, Model) 15% **Midterm:** Theoretical Midterm 10%, practical midterm 10 %, **Daily Assessments**: Homework and Quizzes 5 % **Final Exam**: Theoretical 30%, Practical 30% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**

Session 1 (Week 1)	• The Spruing
	• Sprue
	• Purpose of spruing.
	• Different types of sprue former
	  • According to material made of
	  • According to thickness.
	  • According to the Number & Shape of Sprue Former.
	• Spruing techniques.

Session 2 (Week 2)	The spruing II • Sprue diameter. • Sprue former length.

	• Sprue former direction. • Reservoir. • Purpose of reservoir. • Crucible former. • Types of crucible former • Casting ring and liners. • Considerations in selection of casting rings. • Purpose of ring liner
Session 3 (Week 3)	• Investing. • Requirements of Ideal investment materials. • Steps before investing procedure: • Classification of dental investment materials - Gypsum bonded investing material. - Phosphate bonded investing material. - Silica bonded investing material. • Composition of investment materials.
Session 4 (Week 4)	• The investing II • Shrinkage Compensation Systems for Solidified Gold. • Mechanisms of expansion - Setting Expansion. - Hygroscopic Expansion. - Semi-hygroscopic Expansion. - Thermal Expansion. • Investing techniques. - Single technique. • Brush technique. • Vacuum technique. - Double technique.
Session 5 (Week 5)	• Wax elimination (burnout) • Purpose of Burnout. • Types of burnout. - Controlled burnout. - Non-controlled burnout. • Calibrating the Burnout Furnace's Temperature Indicator. • process of Burnout: • Technique of Controlled Burnout. a. High Heat Technique. b. Low Heat Technique Factors Influencing Burnout Time and Temperature. 1- Temperature Rise Time. 2- Number and Size of the Mold. 3- Preheated Oven
Session 6 (Week 6)	• Casting Process.

	• Definition of casting. • Casting Equipment. 1. Heat source. a. Blowpipe Flame (Blow Torch). • Zones of Blowpipe Flame (Torch Flame). - Mixing zone. - Combustion zone. - Reducing zone. - Oxidizing zone.
Session 7 (Week 7)	•Casting Procedures b. Electric source. 2. Casting Heating Force • Casting Process. 1- Balance the Machine. 2- Prepare the Crucible. 3- Determine the Amount of Alloy Needed. 4- Select the Metal Needed. 5- Wind the Casting Machine. 6- Adjust the Torch Flame. 7- Preheat the Crucible. 8- Melt the Gold and Apply Flux. 9- Position the Ring in the Casting Machine.
Session 8 (Week 8)	• Casting Recovery A- Recovery of the Casting. B- Cleaning of the Casting. C- Pickling. • Pickling Process. • An alternative method of pickling
Session 9 (Week 9)	**PBL Assessment (Project Based Learning)**
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	• Casting Finishing & polishing c- Casting Finishing and Polishing: I. The finishing 1. Inspecting the Casting for Defects. • The major kinds of defects. 2. Removing the Sprue. 3. Test-Fitting the Casting on the Die. 4. Rough-Finishing the Casting's Surface. 5. Adjusting Proximal Contacts. 6. Adjusting the Occlusion. II. Polishing the Casting. a. Preliminary Polish. b. Final Polish.

Session 12 (Week 12)	• Metal-Ceramic Restoration. • Physical Characteristics of the Metal-Ceramic System. 1- Strength of the Bond. a. A chemical bond. b. A compression bond. c. A mechanical bond. 2- Strength of the Substructure. 3. Coefficients of Thermal Expansion. 4. Melting Range of Ceramic Alloys. 5. Thickness of the Veneer.
Session 13 (Week 13)	• Metal Substructure Treatment. • Procedures of metal surface treatment. 1. Surface grinding. - Purposes of surface grinding 2. Ultrasonic cleaning with distilled water or steam cleaning. 3. Heating under vacuum at 1040° C for 2 minutes. 4. Deoxidizing with acids or air abrading with aluminum oxide. 5. Heating at atmospheric pressure at 1040° C for 2 minutes. • Metal Conditioning Agents. 1. Gold Metal Conditioners. 2. Metal Ceramic Conditioners. • Steps of metal conditioners application.
Session 14 (Week 14)	• Porcelain Application & Firing. • Opaque Porcelain. • The major functions of opaque porcelain. • Opaque Effects. White, Gray, Lilac Gray, Pink and Brown. • Applying Opaque Layer. • Applying, Drying and Firing.
Session 15 (Week 15)	**Midterm practical exam**
Session 16 (Week 16)	Porcelain condensation and shrinkage. • Porcelain Condensation. • Porcelain shrinkage. • Methods of Condensing Porcelain o Apply vibration by serrating or tapping with an instrument.. o Perform capillary action o Perform pressure packing by smoothing with a spatula or pressing with a clean tissue. o Continue by whipping.
Session 17 (Week 17)	• All ceramic restoration. • Advantages of all-ceramic restorations. • Disadvantages of all-ceramic restorations. • Types of Dental Ceramics.

	• Tooth Preparation Requirements • In-Ceram Alumina
Session18(Week18&19)	Preparation Steps for all ceramic restoration. **1-** Complete a master cast with removable dies. **2-** Die preparation. **3-** Duplication. **4-** Special plaster model. **5-** Mixing slip material. **6-** Slip application. **7-** Sintering and finishing. **8-** Glass infiltration. **9-** Porcelain application.
Session 19 (Week 20 &21)	• CAD/CAM Restorations. • Definitions and CAD CAM Process 1.The scanning device (optical impression). 2. The computer software (CAD). 3. The Manufacturing devices (CAM) a. Subtractive Manufacturing b. Additive manufacturing. • Fabrication Procedure. • Materials used to form the ceramic block • Advantage of CAD–CAM systems. • Disadvantage of CAD–CAM systems.
Session 20 (Week 22 & 23)	• Pontic and edentulous ridge. • Ideal requirements of a pontic and Pontic design. • Factors affecting the design of a pontic. -Space available for the placement of the pontic. -The contour of residual alveolar ridge. -Amount of occlusal load that is anticipated for that patient. • General design consideration for a pontic. -Saddle pontic, Ridge lap pontic and Hygienic or sanitary pontic. • Length of the edentulous span and occluso-gingival height of the pontic
Session21(Week24&25)	• Aesthetic consideration for fixed restorations. • Definitions. • General principles of aesthetics. • Factors of aesthetic dentofacial composition. • Surgical and non-surgical methods to improve aesthetics. • Types of aesthetic restorative material. • Aesthetic fixed restorations.
Session22(Week26-28)	• Dental Implants • Indications and contra-indications of dental implants. • General principles of implant planning.

	• Clinical considerations Misch Bone Quality Classification and Bone Density Bone height, Bone width, Bone length and Bone angulation. • Planning dental implants in different clinical situations. - Available implant supported prosthetic solutions. - Number of implants required. • Special consideration in restoring teeth in esthetic zone
Session 23 (Week 29)	**Practical final exam**
Session 24(Week30-32)	**Theoretical and oral Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues. - Work in group (team work). - Time management. - Give p.pt presentation. - Criticize his/her work. - Think critically to solve the problem may be faced during the work. - Implement of dental laboratory instruments and devices. - Use the Internet for preparing scientific researches. - Write a report about the steps that implemented in the laboratory.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Removable Orthodontics Appliances

1	**Course name**	**Removable Orthodontics Appliances**
2	**Course Code**	DT403
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 4th year, and this course will provide the students with the necessary theoretical background that includes explanations the laboratory steps of fabricating Adam's clasp, Labial Bow, Active components of Removable Appliances and Functional appliances.
Textbooks required for this Course:	• Orthodontic Removable Appliances, Sandhya Shyam Lohakare. • An Atlas of Removable Orthodontic Appliances Second edition, Gordon c. Dickson • https://rlmc.edu.pk/themes/images/gallery/library/books/dental/[K. G. Isaacson FDS MOrth RCS(Eng), R. T. Reed B(BookFi).pdf • Removable orthodontic appliances 2 reviews by K. G. Isaacson, J. D. Muir, R. T. Reed, W. J. B. Houston 2022 • Removable Orthodontic Appliances Paperback – January 12, 2018 by Anand Lukose , Saurabh Sonar (Author), Puneet Batra • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Presentation's Lectures, small discussion Groups, seminars, project-based learning (PBL), videos, practical (laboratory).
Course Objectives:	Upon completion of this course, the student should have the ability to: • Understand the various processing steps used during fabrication of Removable Orthodontic Appliances. • Identify the various materials used in different laboratory steps. • Recognize the theoretical background of Mechanical Appliances. and Functional Appliances.

	• Identify the different steps of constructing different Removable Orthodontic Appliances. • Write a report about the steps that implemented in the laboratory. • Develop students' time management skills. • Implement a dental laboratory instruments and devices professionally.
Course Assessments	**Assignment 1**: PBL (Report, p.pt presentation, Model) 15% **Midterm:** Theoretical Midterm 10%, practical midterm 10 %, **Daily Assessments**: Homework and Quizzes 5 % **Final Exam**: Theoretical 40%, Practical 20% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• History and Review of Literature •Introduction of removable orthodontics appliances • The Materials •The Tools • Wire Bending
Session 2 (Week 2)	•Classification of Orthodontic Appliances. •Biomechanics.
Session 3 (Week 3)	• Classification of malocclusion Normal occlusion, Class I occlusion, Class II occlusion and Class III occlusion. • Curve of Spee and Wilson Curve.
Session 4 (Week 4 & 5)	• Retentive components of Removable Appliances • Adam's Clasp •Modifications of Adam's clasp:- C' clasp, Ball Clasp Jackson's clasp, Lingual Extension Clasp, Arrowhead Clasp and Delta clasp
Session 5 (Week 6)	•Labial bow, fabrication of Labial bow
Session 6 (Week 7)	Introduction of Active components of Removable Appliances
Session 7 (Week 8 & 9)	• Orthodontic Springs, Finger spring •Cranked single cantilever spring •Z- spring or Double cantilever spring •' T' spring, Coffin spring
Session 8(Week10&11)	• Orthodontic Springs, Finger spring •Cranked single cantilever spring •Z- spring or Double cantilever spring •' T' spring and Coffin spring
Session 9 (Week 12)	**PBL Assessment (Project Based Learning)**
Session 10(Week 13)	**Midterm Exam**
Session11(Week14-16)	• Canine distalization and Canine retractors - U loop canine retractor, Helical canine retractor - Buccal canine retractor, Palatal canine retraction
Session 12 (Week 17)	• APPLIANCE FOR ROTATION CORRECTION. • SCREW APPLIANCE: FOR EXPANSION
Session 13 (Week 18)	• Retention.
Session 14 (Week 19)	• Introduction of Functional appliances

Session 15 (Week 20)	**Midterm practical exam**
Session 16 (Week 21)	• Bionator
Session 17 (Week 22)	• Activator.
Session 18 (Week 23)	• Space Maintainers
Session 19 (Week 24)	• Plate Construction and Finishing.
Session20 (Week 25)	• Functional Occlusion and Occlusion Adjustment
Session 21 (Week 26)	• ELEMENTS OF CEPHALOMETRIC
Session 22 (Week 27)	• Acrylic base plate Mangment
Session 23 (Week 28)	Revision and discussion
Session 24 (Week 29)	**Practical final exam**
Session 25(Week 30-32)	**Theoretical and oral Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: Communicate effectively with colleagues.Work in group (team work): Time management. Give p.pt presentation, Criticize his/her work. Think critically to solve the problem may be faced during the work.Implement of dental laboratory instruments and devices.Use the Internet for preparing scientific researches. Write a report about the steps that implemented in the laboratory.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Maxillofacial Prosthetics

1	**Course name**	**Maxillofacial Prosthetics**
2	**Course Code**	DT404
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed for the 4th year undergraduate dental students. It will provide the students with the necessary theoretical and practical knowledge in the field of maxillofacial prosthetics rehabilitation for patients with congenital and acquired oral and maxillofacial defects including fabrication of intraoral prostheses and extraoral prostheses such as artificial eye, nose, or ear.
Textbooks required for this Course:	• Maxillofacial Rehabilitation. Prosthetic and surgical management of cancer-related, acquired, and congental defects of head and neck. John Beumer III, et.al. 3rd edition, Quintessence Publishing. • Clinical Maxillofacial Prosthetics by Thomas D. Taylor 1st edition 2000 • Textbook of Materials in Maxillofacial Prosthodontics: In Daily Practice Paperback – May 30, 2020 by Vishwas Kharsan • Clinical Maxillofacial Prosthetics Hardcover – Import, 1 January 2000 by Thomas D. Taylor 2000 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Lectures, small discussion Groups, seminars, project-based learning (PBL), videos, practical (laboratory).
Course Objectives:	Upon completion of this course students should be able to: • Understand all types of maxillofacial defects, their etiology, and their prosthetic rehabilitation needs. • Recognize the theoretical background related to maxillofacial prosthetic rehabilitation. • Identify the various materials used in maxillofacial prosthetics. • Identify the different steps of constructing different maxillofacial prostheses. • Fabricate all kind of intraoral maxillofacial prostheses such as obturators and dentures. • Fabricate all kind of extraoral maxillofacial prostheses such as orbital and nasal prostheses. • Identify the various digital technologies used in maxillofacial prosthetics. • Write a report about the fabrication steps that implemented in the laboratory. • Develop students' time management skills. • Implement a dental instruments and devices professionally.
Course Assessments	**Assignment 1**: PBL (Report, p.pt presentation, Model) 15% **Midterm:** Theoretical Midterm 10%, practical midterm 10 % **Daily Assessments**: Homework and Quizzes 5 % **Final Exam**: Theoretical 30%, Practical 30% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to maxillofacial prosthetics Definitions and related terms

	Classification of maxillofacial prosthetics Treatment and team tasks
Session 2 (Week 2)	Maxillectomy defects and their prosthetic rehabilitation Maxillectomy and maxillary resection defects Etiology of Maxillectomy Defects Anatomical structure of maxillectomy defects Maxillectomy classification - Aramany's classification - Brown's classification - Okay's classification
Session 3 (Week 3)	Maxillectomy defects and their prosthetic rehabilitation...continued Disabilities associated with maxillectomy defects - Function - Appearance (aesthetic) - Psychological Trauma Rehabilitation of maxillectomy defects - Surgical rehabilitation - Prosthetic rehabilitation
Session 4 (Week 4)	Maxillectomy defects and their prosthetic rehabilitation...continued Prosthetic rehabilitation of maxillectomy defects I- Surgical obturation for maxillectomy 1- Immediate surgical obturation 2- Delayed surgical obturation II- Interim obturation for maxillectomy III- Definitive obturation for maxillectomy
Session 5 (Week 5)	Soft palate defects and their prosthetic rehabilitation Partial and full soft palate defects Etiology of soft palate defects Anatomy and physiology of soft palate defects Disabilities associated with soft palate defects
Session 6 (Week 6)	Soft palate defects and their prosthetic rehabilitation...continued Prosthetic rehabilitation of maxillectomy defects I- Surgical obturation for soft palate defects Immediate surgical obturation Delayed surgical obturation II- Interim obturation for soft palate defects III- Definitive obturation for soft palate defects
Session 7 (Week 7)	Cleft lip and palate defects and their prosthetic rehabilitation Definitions of cleft lip and palate Structure and development of the palate Causes and predisposing factors of clefts Classification of cleft lip and palate Disabilities associated with cleft lip and palate
Session 8 (Week 8)	Cleft lip and palate defects and their prosthetic rehabilitation...continued Management of congenital cleft lip and palate Maxillofacial team Diagnosis and treatment planning

	Infant feeding treatment Surgical treatment Prosthetic treatment
Session 9 (Week 9)	**PBL Assessment (Project Based Learning)**
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	Mandibulectomy defects and their prosthetic rehabilitation Congenital mandibular defects Acquired mandibular defects Etiology of mandibular defects Disabilities associated with acquired mandibular defects
Session 12 (Week 12)	Mandibulectomy defects and their prosthetic rehabilitation...continued Rehabilitation of the mandibular defects I- Surgical reconstruction rehabilitation using a bone graft II- Prosthetic Rehabilitation Mandibular reconstruction prosthesis Prosthetic fixation of jaw fractures Method of Immobilization 1- Wiring 2- Arch bar 3- Splints
Session 13 (Week 13)	Glossectomy defects and their prosthetic rehabilitation Partial and full glossectomy defects Etiology of glossectomy defects Anatomy and physiology of glossectomy defects Disabilities associated with glossectomy defects
Session 14 (Week 14)	Glossectomy defects and their prosthetic rehabilitation...continued Rehabilitation of glossectomy defects I- Surgical reconstruction and rehabilitation using soft tissue grafting II- Prosthetic Rehabilitation Palatal augmented prosthesis (PAP)
Session 15 (Week 15)	**Midterm practical exam**
Session16(Week16&17)	Midfacial defects and their prosthetic rehabilitation Anatomy and physiology of midfacial region Etiology of midfacial defects Rehabilitation of midfacial defects I- Surgical reconstruction and rehabilitation using soft tissue and bone grafting II- Prosthetic Rehabilitation - Intraoral prostheses - Extraoral prostheses
Session 17 (Week 18)	Facial defects and their prosthetic rehabilitation Etiology of facial defects Ocular defects Orbital defects Nasal defects Auricular defects
Session18(Week19&20)	Facial defects and their prosthetic rehabilitation...continued

	Rehabilitation of facial defects I- Surgical reconstruction and rehabilitation II- Prosthetic Rehabilitation Ocular prostheses Orbital prostheses Nasal prostheses Auricular prostheses
Session 19 (Week 21)	Craniofacial defects and their prosthetic rehabilitation Etiology of Craniofacial defects Craniofacial implants I- Surgical reconstruction and rehabilitation II- Prosthetic Rehabilitation
Session20(Week22&23)	Implant related maxillofacial prosthetics Implant structure and materials Implant types - Dental implants - Mini implants - Zygomatic implants Implant prosthesis connections Implant treatment planning
Session21(Week24&25)	Radiotherapy appliances in maxillofacial prosthetics Radiotherapy treatment concept Types of radiotherapy appliances Fabrication of radiotherapy appliances
Session22(Week26&27)	Digital technology for maxillofacial prosthetics Digitization Visualization Modeling and designing Additive manufacturing and 3D printing Evaluation
Session 23 (Week 28)	Revision and discussion
Session 24 (Week 29)	**Practical final exam**
Session25(Week30-32)	**Theoretical and oral Final Exam**
Attendance Expectations	Students are expected to attend every session, lecture, and lab. Absences are permitted only if there is unavoidable reason.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues. - Work in group (team work). - Time management. - Give p.pt presentation. - Criticize his/her work. - Think critically to solve the problem may be faced during the work. - Implement of dental laboratory instruments and devices. - Use the Internet for preparing scientific researches.

	- Write a report about the steps that implemented in the laboratory.
Course Change	The content of the course is revised on an ongoing basis to ensure its relevance to the changes of new materials or techniques. The educator will update the contents accordingly.

Occlusion Concept

1	**Course name**	**Occlusion Concept**
2	**Course Code**	**DT405**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4 Units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Dental Anatomy
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to the undergraduate students at the 4th year, and this course will provide the students with knowledge including an understanding of ideal occlusion form , function and the nature of normal occlusion for permanent dentation. In addition to theories of reconstruction of occlusion, tempromandibular joint(TMJ), types of articulators, mandibular movement.it also deals with problems of malocclusion and their relation with TMJ.
Textbooks required for this Course:	• Dental anatomy and occlusion. The Williams and Wilkins co,1969 • Ash M, Nelson S "Wheeler's Dental anatomy ,physiology and occlusion"8th Edition, Elsevier 2003. • http://www.quintpub.com/display_detail.php3?psku=B1676# • Occlusion in Implant Dentistry: Concepts and Considerations Paperback – March 28, 2013by Ankita Singh • Mohl ND, Zarb GA, Carlsson GE, Rugh JD. (eds) A Textbook of Occlusion. Carol Stream, IL,USA: Quintessence Publishing Company; 1988. p15. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours

Delivery	Presentation's Lectures, small discussion Groups, seminars, videos, practical (laboratory).
Course Objectives:	Upon completion of this course student should have the ability to: • Understand the ideal occlusion form and function. • Identify the occlusal contact point and all mandibular movements. • Perform the balancing occlusion. • Recognize the ecentric (working and balancing) occlusion • Identify the different steps of constructing occlusal surface and discuss types of contacts relating to the area of the occlusal surface on which their occur. • Recognize different types of mandibular movement and classification of malocclusion. • Construct the perfect occlusal surface for success the restoration. • Write a report about the steps that implemented in the laboratory. • Develop students' time management skills. • Implement a dental laboratory instruments and devices professionally.
Course Assessments	**Assignment 1**: Report, p.pt presentation 15% **Midterm:** Theoretical Midterm 10%, practical midterm 10%, **Daily Assessments**: Homework and Quizzes 5% **Final Exam**: Theoretical 40%, Practical 20% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage.**
Session 1 (Week 1)	• Introduction • Terminology used in occlusion . • Functional –working occlusion. • Nonfunctional-balancing occlusion. • Group function . • Canine guidance. • Incisal guidance
Session 2 (Week 2)	• Occlusion Morphology and Occlusion Concepts. • Centric relation and centric occlusion. • Working side and balancing side. • Eccentric occlusion • Traumatic occlusion
Session 3 (Week 3)	• Anatomy and physiology of masticatory muscle. • Types of masticatory muscle. • Characteristic of masticatory muscle. • Structure of masticatory muscle.
Session 4 (Week 4)	• Action of primary and secondary muscle of mastication. • Function of masticatory muscle. • Neuromascular control of mandibular movement.

Session 5 (Week 5)	• Tempromandibular joint (TMJ). • Anatomy of TMJ. • Components of TMJ. • Relation between TMJ and occlusion. • Signs and symptoms of TMJ disorder.
Session 6 (Week 6)	• Occlusal contact point. - Occlusl contact points with maxillary teeth. - Occlusl contact points with mandibular teeth. • Occlusal relationship of anterior teeth. • Occlusal relationship of posterior teeth.
Session 7 (Week 7)	• Articulator. • Purpose of articulator. • Uses of articulator. • Requirement of articulator • Advantages and limitation.
Session 8 (Week 8)	• classification of articulator. - Based on theory of occlusion. - Based on type of record. - Based on ability to simulate jaw movement. - Based on adjustability. • Components of articulator.
Session 9 (Week 9)	**PBL Assessment (Project Based Learning)**
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	• Mandibular movement. - Rotational movement . - Translation movement. - Opening and closing movement. - Protrusive movement. - Lateral movement.
Session 12 (Week 12)	• Envelope of motion. • In sagittal plane and In horizontal plane. • In fontal plane.
Session 13 (Week 13)	• Principle of occlusion curvatures. • Dental arch formation. • Over bite. • Over jet.
Session 14 (Week 14)	• Dental arch segment. • Phases in development of dental arch. • The leeway space.
Session 15 (Week 15)	**Midterm practical exam**
Session 16 (Week 16)	• The curves of dental arch. - Curve of Spee. - Curve of Wilson. - Curve of Monson. • The curvatures of individual teeth.
Session 17 (Week 17 & 18)	• Angulation of individual teeth in relation to various planes. - Definition and Importance. • Frontal view of the angulation of maxillary teeth. • Frontal view of the angulation of mandibular teeth.
Session 18 (Week 19)	• classification of occlusion.

	- Based on mandibular position. - Based on relation of first permanent molar - Based on organization. - Based on pattern.
Session 19 (Week 20)	• Six keys of normal occlusion. • Incorrect crown torque and occlusal findings. • Anterior and posterior occlusion in case of incorrect crown torque.
Session20(Week 1& 22)	• Malocclusion. • Definition. • Intra arch malocclusion. - Abnormal inclination. - Abnormal displacement. - Spacing and crowding.
Session 21 (Week 23)	**Inter arch malocclusion**: Deep bite and Open bite. • Skeletal malocclusion.
Session22(Week 24)	• Classification of malocclusion. • Angel's classification. • Drawbacks of Angle's classification.
Session23(Week 25)	• Balanced occlusion. • Objective of balanced occlusion. • Characteristics requirement of balanced occlusion. • Type of balanced occlusion.
Session24(Week26&27)	• Factor influencing balancing occlusion. • General consideration for balanced occlusion.
Session25(Week 28)	Revision and discussion
Session 26(Week 29)	**Practical final exam**
Session27(Week30-32)	**Theoretical and oral Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, Implement of dental laboratory instruments and devices and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Oral Hygiene

1	**Course name**	**Oral Hygiene**
2	**Course Code**	**DT406**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2 units
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Dental Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2010/2011

Brief Description:	This course will provide students with a fundamental understanding of the nature of oral pathology and oral hygiene in a complete simplified way. Oral hygiene course gives examples of oral hygiene and those lesions in the wide range of systemic disorders that have oral manifestations.
Textbooks required for this Course:	• Clinical Practice of the Dental Hygienist 12th Edition by Esther Wilkins • Clinical Textbook of Dental Hygiene and Therapy, 2nd Edition by Suzanne Noble 2012 • Clinical Textbook of Dental Hygiene and Therapy by Robert Ireland 2006 • Community Oral Health Practice for the Dental Hygienist by Christine French Beatty 5th Edition • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, project based learning (PBL), videos, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course student should have the ability to: • Practice of keeping one's mouth clean and free of disease and other problems (e.g. bad breath) by regular brushing of the teeth (dental hygiene) and cleaning between the teeth • Understand the stages of disease formation, its nature and causes • Identify the students on the most important diseases the effect the oral tissue • Recognize the types of dental caries. • Identify representations, terms, conditions that used in oral pathology • Recognize different abnormality of the teeth. • Write the stages of plaque formation.

	• Implement a diagnoses about the disease by using special instruments.
Course Assessments	**Assignment 1**: Report, p.pt presentation 15% **Midterm:** Theoretical Midterm 10%, practical midterm 10%, **Daily Assessments**: Homework and Quizzes 5% **Final Exam**: Theoretical 40%, Practical 20% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to principle of Oral Hygiene • Emergency procedures • Oral Cavity. •Intraoral landmarks. • Extraoral landmarks.
Session 2 (Week 2)	Pedodontic patient/Family abuse and neglect The Professional Dental Hygienist A. History of the Dental Hygiene Profession B. Objectives for Professional Practice C. Dental Hygiene Process of Care D. Professionalism
Session 3 (Week 3&4)	•Behavior modification • Early childhood caries 1. Prevention a. Relationship to maternal caries b. Fluorides 2. Treatment •Habits 1. Recognition 2. Treatment options •Periodontal diseases 1. Recognition 2. Etiology
Session 4 (Week 5)	Effective Health Communication A. Types of Communication B. Health Communication C. Health Literacy D. Communication across the Life Span E. Social and Economic Aspects of Health Communication F. Cultural Considerations
Session 5 (Week 6&7)	Topics to be covered in the session (week) . Dental Soft Deposits, Biofilm Calculus, and Stains A. Dental Biofilm and Other Soft Deposits B. Acquired Pellicle C. Dental Biofilm D. Supragingival and Subgingival Dental Biofilm E. Composition of Dental Biofilm F. Clinical Aspects of Dental Biofilm G. Significance of Dental Biofilm H. Materia Alba I. Food Debris J. Calculus K. Calculus Composition L. Calculus Formation

	M. Attachment of Calculus N. Significance of Dental Calculus O. Clinical Characteristics P. Prevention of Calculus
Session 6 (Week 8)	the Periodontium A. The Normal Periodontium B. The Gingival Description C. The Gingiva of Young Children
Session 7 (Week 9)	• . Infectious diseases • Bacterial infections • Definition • Mode of infection • Exogenous infection Endogenous infection
Session 8 (Week 10&11)	Periodontal Disease Development A. Periodontal-Systemic Disease Connection B. Risk Assessment C. Etiology of Periodontal Disease D. Risk Factors for Periodontal Diseases E. Pathogenesis of Periodontal Diseases F. Gingival and Periodontal Pockets
Session 9 (Week 12)	**PBL assessment (project based learning)**
Session 10 (Week 13)	**Midterm Exam**
Session 11 (Week 14)	Dental Hygiene Diagnosis A. Assessment Findings B. The Periodontal Diagnosis and Risk Level C. Dental Caries Risk Level D. The Dental Hygiene Diagnosis and Prognosis
Session 12 (Week 15)	The Dental Hygiene Care Plan A. Preparation of a Dental Hygiene Care Plan B. Components of a Written Care Plan C. Sequencing and Prioritizing Patient Care D. Presenting the Dental Hygiene Care Plan E. Informed Consent
Session 13 (Week 16)	Topics to be covered in the session (week) • dental caries • definition of dental caries Theories for dental caries Hypothesis for etiology of dental caries Role of saliva
Session 14 (Week 17)	Reventive Counseling and Behavior Change A. Steps in a Preventive Program B. Patient Counseling C. Patient Motivation and Behavior Change D. Motivational Interviewing E. Exploring Ambivalence F. Eliciting and Recognizing Change Talk

Session 15 (Week 18)	Protocols for Prevention and Control of Dental Caries A. History of Dental Caries Management B. The Dental Caries Process C. Dental Caries Classification D. Caries Risk Assessment E. Implementation of CRA in the Process of Care
Session 16 (Week 19)	**Midterm practical Exam**
Session 17 (Week 20)	Oral Infection Control: Toothbrushes and Toothbrushing A. Development of Toothbrushes B. Manual Toothbrushes C. Power Toothbrushes D. Toothbrush Selection E. Methods for Manual Toothbrushing F. Adverse Effects of Toothbrushing
Session 18 (Week 21)	Oral Infection Control: Interdental Care A. The Interdental Area B. Planning Interdental Care C. Selective Interdental Biofilm Removal D. Methods for Interdental Aids
Session 19(Week 22)	Fluorides A. Fluoride Metabolism B. Fluoride and Tooth Development C. Demineralization vs. Remineralization D. Effects and Benefits of Fluoridation
Session 20 (Week 23)	Principles of Evaluation A. Evaluation based on Goals and Outcomes B. Evaluation of Clinical Outcomes C. Evaluation of Behavior Changes D. Comparison of Assessment Finding
Session 21 (Week 24)	abnormalities of teeth Alterations in size, microdontia, macrodontia
Session 22 (Week 25)	Continuing Care A. Goals of the Continuing Care Program B. Continuing Care Procedures C. Appointment Intervals D. Methods for Continuing Care System
Session 23 (Week 26)	Pulp calcification Abnormalities of dental pulp
Session 24 (Week 27)	Internal resorption External resorption
Session 25 (Week 28)	Revision and discussion
Session 26 (Week 29)	**Practical final exam**
Session27(Week28-32)	**Theoretical and oral final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	By the end of the course, the student be able to: - Communicate effectively with colleagues.

	- Work in group (team work). - Time management. - Give p.pt presentation. - Implement of dental laboratory instruments and devices. - Write a report about the steps that implemented in the laboratory. - Use the Internet for preparing scientific researches. - Criticize his/her work. - Think critically to solve the problem may be faced during the work.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

سادسا: المقررات الدراسية لقسم تقنية التخدير

أ - المقررات الدراسية السنة الثانية قسم تقنية التخدير

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain.

	• Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder) • Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color

	• Receptors and glands • Skin burns and disorders • Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long

	learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to:

	• The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis. • The metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science. • The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To

	ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Microbiology

1	**Course name**	General Microbiology
2	**Course Code**	MT203
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	By the end of the course students will be able to: * The definition of microorganism and and all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells. *know Methods and types sterilization and disinfectant. * Culturing and cultivation of Microorganisms and basic way of their identifications
Textbooks required for this Course:	• Text book of microbiology First Published in 2010 by Prem C. Bakliwal forAavishkar Publishers ISBN 978-81-7910-306-7. • https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf • https://open.umn.edu/opentextbooks/textbooks/873 • https://www.britannica.com/science/microbiology • https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/1%3A_Introduction_to_Microbiology • https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells. • Comprehend the fundamentals of molecular microbiology. • Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.

	• Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health. • Understand Microbial Cell Structure, Function and methabolism.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction, of microbiology
Session 2 (Week 2)	History of Microbiology
Session 2 (Week 3)	• Defining Microbes and Basic concepts and scope of microbiology
Session 3 (Week 4)	Pasteur and spontaneous Generation
Session 4 (Week 5 & 6)	Types of microorganisms
Session 5(Week 7,8)	Classification of microorganisms
Session6(Week 9)	Immunization, antiseptics and antibiotics
Session 7(Week 10)	Microscopy
Session 8(Week 11)	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
Session9(Week 12)	Bacterial structure& composition
Session10(Week 13)	Bacterial Genetics
Session11(Week 14 & 15)	4. Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
Session12(Week 16)	**Midterm exam**
Session13(Week 17)	Isolation and culturing of Bacteria
Session14(Week 18 & 19)	Microbial metabolism
Session15(Week 20)	Classification of bactria
Session16(Week 21)	Dyes and staining (gram stain, acid fast staining, and other staining metods).
Session17(Week22 & 23)	Fungi: 1. what is mycology? 2. Classification and structure 3. Moulds, yeasts and dimorphic fungus. Fungal diseases Algae: 4. Characteristics, structure and division of algae
Session18(Week 24 & 25,26)	Viruses 1. Definition, Characteristics, symmetry and structure of viruses, 2. Classification and growth of Viruses. 3. Detection, multiplication of Viruses. 4. Laboratory methods used for viral detection
Session19(Week 27,28)	Parasites 1. Definition, Characteristics and structure of parasites, 2. Summary of Parasitic Classification (Protozoa and Helminths). 3. Detection, multiplication of Protozoa and Helminths. 4. Laboratory methods used for viral detection
Session21 (Week 29)	Revision and discussion
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed.

	Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Histology

1	**Course name**	Histology
2	**Course Code**	MT204
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Histology and Know the different types of tissues of the body Recognize the function performed by each tissue Learn about common terms and definitions used in histology
Textbooks required for this Course:	• DiFiore's atlasof histologywith functionalcorrelations. Junqueira'sBasic Histology. • Histology: An Essential Textbook by D. J. Lowrie Jr 2020 • Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021 • Textbook of Histology by Leslie P. Gartner PhD 2021 • Histology: A Text and Atlas 7th edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015 • Wheater's Functional Histology: A Text and Colour Atlas 3rd edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion.

	self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire a basic background in histology and comparative histology in different and to understand the properties of cells and their interactions with one another as components of tissues and organs. • Understand how structure and function correlate at the microscopic level and be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination. • Understandthe changes that occur to tissues • Identify the different types of tissues • Recognize the types of tissues and the mechanisms of identifying them • understand the various diagnostic tools and medical equipment in the correct way to discover histological changes • Understand how to distinguish tissue and how it develops • deduce the causes of the changes that have occurred within the tissues
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to histology •histology and its mode of study
Session 2 (Week 2)	• The cell
Session 3 (Week 3)	• Epithelial Tissue
Session 4 (Week 4)	• Connective tissue
Session 5 (Week 5)	• Cartilage
Session 6 (Week 6)	• Bone
Session 7 (Week 7)	• Bone.
Session 8 (Week 8)	Muscle Tissue
Session 9 (Week 9)	Nerve Tissue
Session 10 (Week 10)	•Nervous System
Session 11 (Week 11)	The Immune System &
Session 12(Week 12)	Lymphoid Organs
Session 13(Week 13	Blood and Hemopoiesis
Session 14 (Week 14)	Endocrine System
Session 15(Week 15)	Hormones
Session 16(Week 16)	The integumentary system
Session 17 (Week 17)	The Circulatory system
Session 18 (Week 18)	The Circulatory system
Session 19 (Week 19)	The Circulatory system
Session 20 (Week 20)	• Respiratory system
Session 21 (Week 21)	Respiratory system
Session 22 (Week 22)	Respiratory system
Session 23 (Week 23)	Digestive system

Session 24 (Week 24)	The urinary system
Session 25 (Week 25)	The urinary system
Session26(Week26- 27)	Reproductive system
Session26(Week28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
	Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
	Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7

	• Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪

	•Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle • Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation

	•TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex
Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney •Urine formation •Micturition •Renal failure •Male reproductive •Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland Parathyriod Adernal gland Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	BSc Of Medical Technology
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.

	• Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be famillar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell

Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.

	• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**

Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English

9	Date of course approval	2022
Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.	
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4	
Course Duration	2 * 28 = 56 teaching hours	
Delivery	Lectures, Problem based learning and Class discussion.	
Course Objectives:	This course introduces medical technology students to the field of medical ethics. The objective of the course is: • To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner • Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.	
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.	
Content Breakdown	**Topics Coverage**	
Session 1 (Week 1)	Introduction and history of medical ethics	
Session 2 (Week 2)	Principles of medical ethics	
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues	
Session 4 (Week 6 -7)	Ethics of medical research	
Session5 (Week 8 - 9)	Informed consent	
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility	
Session 7 (Week 12 -13)	Ethics of healthcare system	
Session 8(Week 14)	Professionalism	
Session 10(Week 15)	Review and general discussion	
Session 11(Week 16)	**Med term exam**	
Session 12(Week17-18)	Medical errors	
Session13(Week 19-20)	Libya law of medical responsibility	
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life	
Session 15 (Week 23)	Ethics of authorship and publication	

Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and

	types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 5. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others; • Learn to select, use, and critically analyze current HCMN research and literature; • Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management

	Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources
Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physics related Anesthesia

1	**Course name**	**Physics related Anesthesia**
2	**Course Code**	**AT201**
3	**Course type: /general/specialty/optional**	**specialty**
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Physics
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will cover all topics related to equipment, physics and clinical measurement. Presents easy to understand information in a highly readable format with figures throughout to illustrate equipment and principles.
Textbooks required for this Course:	• Text book Basic Physics & Measurement in Anesthesia, 5th Edition • An introductory text to the physical principles and their clinical application in anesthesia. • Basic Physics & Measurement in Anaesthesia by Paul Davis, Gavin Kenny 5th Edition - June 3, 2003 • Fundamental Physics in Anaesthesia by Lalit GuptaAnshul 2022 DOI: 10.9734/bpi/ntpsr/v7/2902A • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 traching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have the ability to: • Knowledge of simple physics in order to understand fully the function of many items in anesthetic apparatus. • Offers a comprehensive guide to physical principles and their clinical application in anesthesia to help the reader practice safe and reliable anesthesia.

	• Uses clinical examples throughout to aid in understanding. • Provides practical advice on essential measurement and monitoring using the latest equipment and technology. • Students are expected to understand states of matter, principles of dynamics of gases and fluid, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of in the realm of physics
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction of physics
Session 2 (Week 2)	Pressure • This part discusses pressure measurements both in patients and on the anesthetic machine. Pressure is the force applied or distributed over a surface, and it is expressed as force per unit area.
Session 3 (Week 3)	Fluid Flow • This part discusses the different types of fluid flow. Flow is defined as the quantity of a fluid. In laminar flow, a fluid moves in a steady manner, and there are no eddies or turbulences. This is the type of flow normally present in smooth tubes at low rates of flow.
Session 4 (Week 4)	Volume and Flow Measurement I • This part discusses different techniques used for volume and flow measurement in clinical situations. The Benedict Roth spirometer is widely used for both physiological and clinical studies.
Session 5 (Week 5)	Volume and Flow Measurement II • In this method, a light bell moves with the patient's breathing, and this movement may be recorded by a pen on a rotating drum, the motion of the bell being transferred to the pen through a connecting wire that passes over two pulleys. A water seal prevents the leakage of gas from the bell, and this seal is kept small to reduce the volume of gas that dissolves in the water.
Session 6 (Week 6)	The Gas Laws I

	• This part discusses the gas laws. All substances are composed of atoms or molecules. In a solid, the atoms or molecules are usually arranged in a regular formation called a lattice, and each molecule in the lattice exerts forces on its neighbors and is continuously in motion, oscillating about a mean position.
Session 7 (Week 7)	. The Gas Laws II • If heat is added to a solid, each molecule vibrates with greater amplitude and, therefore, takes up a greater amount of space.
Session 8 (Week 8)	Natural Exponential Functions • Natural exponential function is a special form of nonlinear change often encountered in medicine and usually referred to for convenience as an exponential. If the flow from the bath is assumed to be laminar, then the rate of flow is directly proportional to the pressure head. On the other hand, the pressure head of water driving the flow out
Session 9 (Week 9)	Solubility • This chapter discusses the concept of solubility. When a liquid is placed in a closed container, equilibrium is eventually established at the surface between the vapor of the liquid and the liquid itself. In this equilibrium state, the partial pressure exerted by the vapor is known as the saturated vapor pressure.
Session10(Week10-11)	Diffusion and Osmosis I • This chapter discusses osmosis and diffusion as the transport of molecules from a surface of the solution. Diffusion is the process by which the molecules of a substance transfer through a layer or area, such as the surface of a solution.
Session 11 (Week 12)	Diffusion and Osmosis II Diffusion can take place without a membrane or a gas-liquid barrier. Fick's law applies only in a single homogeneous phase if gases are transferring from one phase into another as in the case of gases passing into solution.
Session 12(Week 13)	• Understanding of anesthesia cylinder, colorcoding, arrangement of different type of cylinder
Session 13(Week 14)	• Medical gas pipeline system. • Understanding administration of gas flow
Session 14 (Week 15)	**Midterm exam**
Session 15(Week 16)	Work, Energy and Power I This part discusses work, energy, and power, with special reference to ventilation and cardiac output. Mechanical work is a

	form of energy, and other forms of energy include heat energy and chemical energy. Work is done or energy is expended whenever the point of application of a force moves in the direction of the force.
Session 16(Week 17)	Work, Energy and Power II A constant-pressure generator type of ventilator presents a good example of the interrelationship between the force and distance moved and the pressure and volume changes. During expiration, the pressure at the ventilator falls rapidly to atmospheric and remains at zero while the air is expired. During inspiration, about half the mechanical energy used is stored as potential energy in the elastic tissues of the lung and the chest wall
Session 17 (Week 18)	Temperature: This part discusses the concept of heat and temperature. An analogy may be drawn between the relationship of heat to temperature and the relationship of the quantity of a solute to its concentration. Thus, in the same way that temperature rises as heat energy is added to a substance, concentration rises as a solute is added to a solution. In each case, if the substance or solution is divided into two equal parts, each part will have the same temperature or concentration although the heat energy or quantity of solute in each case is halved.
Session 18 (Week 19)	Heat Capacity and Latent Heat
Session 19 (Week 20)	Simple oxygen admistration devices
Session 20 (Week 21)	Method of controlling gas flow
Session 21 (Week 22)	Vaporizers • This part discusses the clinical application of saturated vapor pressure in vaporizers. A vaporizer is a device for adding clinically useful concentrations of anesthetic vapor to a stream of carrier gas.
Session22(Week23-24)	Humidification I This chapter discusses the clinical importance of humidity. Humidity is of importance in the operating theater because high humidity is unpleasant while low humidity may allow the build-up of static charges with a risk of explosion if flammable agents are in use. There are two methods of increasing the inspired humidity artificially. The first is by humidifying the environment, and the second is by humidifying the inspired gases alone
Session 23 (Week 25)	Humidification II • There are two methods of increasing the inspired humidity artificially. The first is by humidifying the environment, and the second is by humidifying the inspired gases alone
Session 24 (Week 26)	Oxygen concentrator
Session 25(Week 27)	Use of oxygen purity meter
Session 26(Week 28)	Revision and discussion
Session 26(Week 29-30)	**Final Exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Anesthesia Equipment Principles and Applications

1	**Course name**	**Anesthesia Equipment Principles and Applications**
2	**Course Code**	**AT202**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of basic Principles of anesthesia and Resuscitation Urgent Care cover the basic principles of physiology and relevant pharmacology related to anesthesia field.
Textbooks required for this Course:	• Anesthesia Equipment text book, Authors: Jan Ehrenwerth, James Eisenkraft, James Berry ,3rd edition 2020 • The MGH Textbook of Anesthetic Equipment by Warren Sandberg, MD, Richard Urman, MD, and Jesse Ehrenfeld, MD, 2011

	• Anesthesia Equipment Principles and Applications by Jan Ehrenwerth, James Eisenkraft, James Berry 3rd Edition - August 7, 2020 • Anesthesia Equipment: Principles and Applications by J. Ehrenwerth & J. B. Eisenkraft & J. M. Berry 2013 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, active participation, Laboratory experiments, Hospital training
Course Objectives:	Upon completion of this course, the student will have the ability to: • provides guidance on the safe use of a wide range of anaesthesia apparatus and best anesthetic equipment. • Technology-driven changes, together with the high risks associated with anesthesia delivery, require that you understand everything from physics fundamentals to special situations to troubleshooting so you can safely and effectively use all the equipment and instrumentation in today's operating rooms. • provide detailed information on the intricate workings of each device or workstation • keeping fully up to date and helping you meet both equipment and patient care challenges. The methodology followed in this course is oriented towards the achievement of the learning objectives. • A wide range of teaching and learning tasks are implemented, such as Lectures will be lead following classical oral presentation for all students • Practice sessions: the methodology follows is based on participate group students and it will be held in the research • seminars • The workshops will be in small groups that we split according to the number of students.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Gases and Ventilation** • Medical Gases: Storage and Supply • Overview • Medical Gas Cylinders and Their Use • Characteristics of Gas Cylinders • Gas Cylinder Safety Issues
Session 2 (Week 2)	**Gases and Ventilation** • Guidelines for Use of Medical Gas Cylinders • Medical Gas Pipeline Systems • Medical Gas Central Supply Systems

	• Medical Gas Pipelines • Hazards of Medical Gas Delivery Systems • Procedures
Session3 (Week 3)	**The Anesthesia Machine and Workstation** • Anesthesia Gas Delivery System • Anesthesia Machine Components • Gas Flow Through the Anesthesia Machine • Anesthesia Workstation Obsolescence and Pre-Use Checks • Contemporary U.S. Anesthesia Workstations
Session 4 (Week 4)	**Anesthesia Vaporizers** • General Principles • Vapor, Evaporation, and Vapor Pressure • Regulating Vaporizer Output • Effect of Use Variables on Vaporizer Function • Contemporary Vaporizers
Session 5 (Week 5)	**Breathing Circuits** • Introduction • History of Device Development • Classifications of Breathing Circuits • Components of a Breathing Circuit • Carbon Dioxide Absorption • Bacterial Filters • Analysis of Specific Circuits • Circuit Malfunction and Safety
Session 6 (Week 6)	**Waste Anesthetic Gases and Scavenging Systems** • Trace Concentrations of Anesthetic Gases • Sources of Anesthetic Gas Contamination • Operating Room Ventilation Systems • Waste Gas Scavenging Systems • Hazards of Scavenging
Session 7 (Week 7)	**Waste Anesthetic Gases and Scavenging Systems** • Low-Flow Scavenging Systems • Anesthetic Leak Detection and Waste Gas Management • Work Practice Recommendations • Monitoring Trace Levels of Anesthetic Gases • Are Trace Concentrations of Waste Anesthetic Gases Hazardous? • Environmental Concerns • Technologies for Reduction of Waste Gas Release to the Environment
Session 8(Week 8)	**Anesthesia Ventilators** • Overview • History • Physiology and Mechanical Concepts • Physics of Gas Flow • Lung Function During Anesthesia And Mechanical Ventilation • Classification, Special Features, and Modes of Ventilation

Session 9 (Week 9)	**Anesthesia Ventilators** Capabilities and Limitations of Anesthesia Ventilators Modes of Ventilation Current Designs of Anesthesia Ventilators Ventilator Concerns With Use Check-Out Procedures
Session 10 (Week 10)	**Humidification and Filtration** • Overview • Physics of Humidity • Physiology of Humidification • Filtration • Heat and Moisture Exchangers
Session 11 (Week 11)	**Respiratory Gas Monitoring** • Overview • Gas Sampling Systems • Units of Measurement • Gas Analysis Technologies • Infrared Analysis • Raman Spectroscopy
Session 12 (Week 12)	**Respiratory Gas Monitoring** • Water Vapor and Accuracy of Capnometers • Colorimetric Carbon Dioxide Detectors • Oxygen Analyzers • Balance Gas • Exotic Gases • Applications of Gas Monitoring
Session 13(Week 13)	**Respiratory Gas Monitoring** • Complications of Gas Monitoring • Credentialing for Use of Gas Monitoring • Practice Parameters • American Society of Anesthesiologists Standards for Post anesthesia Care
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	**Monitoring Ventilation** • Overview • Respiratory Rate • Airway Pressures • Volume Measurement • Measurement of Gas Flows • Spirometry, Curves, and Loops • Capnography and Volumetric Capnography • Display of Ventilation Data • Practice Parameters
Session 16 (Week 16)	**Patient Monitors** **Capnography** • Overview • Terms and Definitions • Measurement Techniques • Systematic Interpretation of Time Capnography • Volumetric Capnography

	• Clinical Applications – Time-Based Capnography • Common Pitfalls • The Future
Session 17(Week 17)	**Pulse Oximetry** • Hemoglobin Saturation and Oxygen Transport • History of Pulse Oximetry • Physics and Engineering of Pulse Oximetry • Sources of Error • Multiwavelength Pulse Oximetry • Clinical Applications: Accuracy, Response, and Limitations
Session 18 (Week 18)	Temperature Monitoring • Overview • Thermoregulation • Effects of Anesthesia • Mechanisms of Intraoperative Heat Loss • Effects of Mild Perioperative Hypothermia • Hyperthermic States • Perioperative Temperature Management • Transducers and Devices for Measuring Temperature • Temperature Monitoring Sites • Guidelines for Temperature Monitoring
Session 19 (Week 19)	**Other Equipment Airway Equipment** • Airway Patency, Access, and Patient Positioning • Patient Positioning • Techniques for Perioperative Oxygenation • Tracheal Tubes • Laryngoscopy • Intubating Adjuncts: Tube Introducers, Tube Exchangers, and Lighted Stylets • Airway Exchange Catheters • Optical Stylets and Tubes • Flexible Intubation Devices • Supraglottic Airways • Invasive Airway Techniques
Session20 (Week 20)	**Preventing Transmission of Infectious Diseases** • Overview • Hand Hygiene • Equipment • Preventing Blood-Borne Transmission • The Anesthesia Machine • Airborne Transmissible Disease • Managing Infectious Disease Risks to Anesthesia Professionals
Session 21 (Week 21)	**Infusion Pumps** • Background • Gravity-Driven Infusions • Positive-Pressure Pumps • Patient-Controlled Analgesia • Modern Infusion Pump Features • Infusion Safety • Emerging Technologies

	• Considerations for Pump Selection
Session 22 (Week 22)	**Vigilance, Alarms, and Ergonomics** **Vigilance, Alarms, and Integrated Monitoring Systems** • Overview • Anesthesia Mishaps • Vigilance and Monitoring Performance • Role of Standards in Anesthesia Equipment Design • Alarms • Integrated Monitoring Systems
Session23(Week 23-28)	**Ergonomics of the Anesthesia Workspace** • History • What is Ergonomics? • Ergonomics Research in Anesthesiology • Ergonomics Guidelines • Ergonomics in Design **Safety, Standards, and Quality** **A. Hazards of the Anesthesia Delivery System** • Perspective • Complications • Circuit Pressure and Volume Problems • Anesthetic Agent Dosage and Administration Problems • Prevention of Complications • Cybersecurity of Medical Devices and the Implications of Cybersecurity Vulnerabilities • Definitions **B. Machine Checkout and Quality Assurance** • Overview • Background • Pre-anesthesia Checkout • Equipment Quality Assurance **C. Electrical and Fire Safety** • Introduction • Principles of Electricity • Electrical Shock Hazards • Electrical Power: Grounded • Electrical Power: Ungrounded • The Line Isolation Monitor • Ground Fault Circuit Interrupter • Double Insulation • Microshock • Electrosurgery • Environmental Hazards • Electromagnetic Interference • Construction of New Operating Rooms • Fire Safety **D. Standards and Regulatory Considerations** • Overview • Regulation of Medical Devices • Role of Standards in Medical Device Regulation • Medical Device Voluntary Standards

مكونة الوحدة الوطنية
الوزير
وزارة التعليم العالي والبحث العلمي

Session24(Week 29)	**Revision and discussion**
Session 25(30-32Week)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press.

	• Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications. • http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.

Content Breakdown	Topics Coverage
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem • Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach

Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling • Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pathology

1	**Course name**	**Pathology**
2	**Course Code**	MT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences, plus investigation of those pathological mechanisms common to all tissue-cell pathology. Attention is paid to the processes of cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Robbins & Cotran Pathologic Basis of Disease (Robbins Pathology) 10th Edition by Vinay Kumar MBBS MD FRCPath Abul K. Abbas MBBS , Jon C. Aster MD PhD 2020 • Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744. • Textbook of pathology by Harsh Mohan 6th edition, ISBN: 978-81-8448-702-2, 2010. • https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to:

	• Understand the common terms and definitions used in pathology • Identify of the nature of the disease, including its causes, growth patterns, and consequences • Recognizethe biological characteristics that distinguish each disease from the other. • The ability to distinguish the origin of the disease and how it develops The ability to distinguish the origin of the disease and how it develops •That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment •The student will infer the causes of disease and its growth patterns •The student determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Pathology gives explanations of a disease by studying the following four aspects of the disease 1. Aetiology 2. Pathogenesis 3. Morphologic changes 4. Functional derangements and clinical significance •The causes of disease Environmental factors Genetic Factors
Session 2 (Week 2)	**Cell injury.** - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury (Reversible & Irreversible cell injury).
Session 3 (Week 3)	**Cell injury.** - Free radicals (sources, effects & destruction of FR). - Cell injury by chemicals and Cell injury by viruses.
Session 4(Week 4)	**Cell injury.** - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
Session 5 (Week 5)	• **Inflammation .** a. Acute inflammation & its types.
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	• **Repair and healing.**
Session 8 (Week 8)	• **Infectious diseases.** a. Bacterial, Viral, Fungal and Parasitic infection - a general outline b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis & Hydatid disease.
Session 9 (Week 9)	•**Immunopathology.** 1. Immune mechanism of tissue injury:

	a. Type I hypersensitivity. b. Type II hypersensitivity. c. Type III hypersensitivity. d. Type IV hypersensitivity. e. Tissue transplantation.
Session 10 (Week 10)	2. Autoimmune diseases: a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis. c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
Session 11(Week 11)	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
Session 12(Week 12)	• **Nutrition disorder.** Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• **Ionizing radiation**. a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• **Hemodynamic disorders** Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	**GENETIC DISORDERS** a. Single - Gene Defect "Mendalian Disorders" b. Disorders with Multifactorial Inheritance
Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• **Neoplasia.** - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	**Respiratory diseases.** Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	**Cardiovascular diseases .** - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28)	**Revision and discussion**
Session 22(Week29 - 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Principle of Anesthesia

1	**Course name**	**Principle of Anesthesia**
2	**Course Code**	AI301
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Anatomy , physiology and pharmacology
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of Principles of anesthesia cover the basic principles of physiology and relevant pharmacology related to anesthesia field.
Textbooks required for this Course:	▪ Fundamental Principles and Practice of Anaesthesia 1st Edition ▪ Anesthetic Pharmacology Basic Principles and Clinical Practice, 2nd Edn, A. Evers, M. Maze and E. Kharasch (editors). ▪ Principles of Anesthesia Equipment by Yasodananda K Areti, Bhavani Shankar Kodali 1st edition 2016 ▪ Atlas of Anesthesia: 8-Volume Set 1st Edition ▪ by Ronald D. Miller MD MS (Editor), Robert R. Kirby MD (Editor), Debra A. Schwinn MD (Editor) ▪ Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion , active participation, Laboratory experiments Hospital training
Course Objectives:	Upon completion of this course, the student will have the ability to: • Understand basic physiological and pharmacological action of anesthetic drugs within all types (local, general, regional, analgesic and sedative and muscle relaxant, etc.) • Identify concepts in the principles of anesthesia. • Describe the different anesthetic drugs, their preparation methods, and their use • Identify representations, terms, conditions, and principles of anesthesia • Recognize different Anaesthetic triad, the component parts of a typical general Anaesthetic, and adjunctive drugs and techniques. • The student should be able to communicate in writing and orally

	• The student should be able to work in a team
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Anesthesia History of Anesthesia Preoperative assessment and patient history
Session 2 (Week 2)	Introduction to Anesthesia Preoperative assessment and patient history
Session3 (Week 3)	Physiology of Anaesthesia
Session 4 (Week 4)	Anesthesia and the lung
Session 5 (Week 5)	The cardiovascular system
Session 6 (Week 6)	The cardiovascular system and Anesthesia
Session 7 (Week 7)	Anesthesia and the central nervous system
Session 8(Week 8)	The cardiovascular system and Anesthesia
Session 9 (Week 9)	Physiology of Anesthesia Anesthesia for ear and nose procedures
Session 11 (Week 10)	Anesthesia for throat procedures
Session 12 (Week 11)	Physiology of Anesthesia The kidney and Anesthesia.
Session 13(Week 12)	Physiology of Anesthesia The liver and Anaesthesia
Session 14 (Week 13)	Physiology of Anesthesia The liver and Anaesthesia
Session 15 (Week 13)	**Midterm exam**
Session 16 (Week 16)	Perioperative management of selected endocrine disorders
Session 17(Week 17)	Perioperative management of selected endocrine disorders
Session 18 (Week 18)	Pharmacology of Anaesthesia: General autonomic nervous system pharmacology
Session 19 (Week 19)	General Anaesthetic drugs Intravenous Anaesthetic drugs
Session20 (Week 20)	Inhalation Anaesthetic drugs
Session 21 (Week 21)	The pharmacokinetics of inhaled Anaesthetic drugs
Session 22 (Week 22)	Neuromuscular blocking drugs
Session23(Week23-27)	Local Anaesthetic Drugs
Session24(Week28)	Drug interactions V. Principles of premedication The opioids Sedative drugs Antiemetic drugs Hypertensive drugs
Session25(Week29)	Revision and discussion
Session26(Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.

Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Paediatric

1	**Course name**	**Paediatric**
2	**Course Code**	**AI302**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental to Construct basic knowledge aboutchildren age stages. Recognize the paediatric illnesses and assessment the severity of cases. Identify the treatment plan.
Textbooks required for this Course:	• Essential Paediatrics and Child Health, 4th EditionMary Rudolf, Anthony Luder, Kerry Jeavons 2020 • American Academy of Pediatrics Textbook of Pediatric Care Edited by Thomas K and others ISBN electronic: 978-1-61002-579-9 • Illustrated Textbook of Paediatrics Fourth Edition Edited by Dr Tom Lissauer MB BChir FRCPCH • Honorary Consultant Paediatrician, Imperial College Healthcare Trust,London, UK 2012, ISBN 978 0 7234 3565 5 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably to:

	• Identify children age stages. • Describe the kids disease. • Compare between morbid child and healthy child in same age. • Recognize child disease. • Ability to assess illness.
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam. A60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Growth and development of a child from birth to 12 years: including physical, social.
Session 2 (Week 2)	Growth and development of a child from birth to 12 years: including adaptive development.
Session 3(Week 3)	List the maternal and neonatal factors contributing to high risk pregnancy. The neonatal inherited diseases; maternal infections - viral and bacterial; maternal diseases incidental to pregnancy.
Session 4(Week 4)	chronic maternal diseases such as heart diseases, renal failure, tuber-culosis, diabetes, epilepsy; bleeding in the mother at any trimester
Session 5 (Week 5)	poliomyelitis, blindness, deafness, mental retardation and Hypothyroidism.
Session 6(Week 6)	Cerebral Palsy: Define and briefly outline etiology Prenatal perinatal and postnatal causes; briefly mention pathogenesis.
Session 7(Week7)	Types of cerebral palsy (Classification), findings on examination; General examination, examination of C.N.S. Musculoskeletal system, respiratory system, Gastro-intestinal tract & nutritional status.
Session8 (Week 8)	Erb's palsy: define and briefly outline etiology, clinical features.
Session9 (Week 9)	Erb's palsy: investigation and management (medical & surgical).
Session 10 (Week 10)	Congenital muscular Torticollis: define and briefly outline etiology.
Session 11 (Week 11)	Congenital muscular Torticollis: clinical features, investigation and management.
Session 12(Week12)	Club foot deformity (Talipes equinovarus): define and briefly outline etiology, clinical features, investigation and management.
Session 13 (Week 13)	Congenital Dislocation of Hip: define and briefly outline etiology, clinical features.
Session14(Week 14)	**Midterm Exam**
Session 15 (Week 15)	Congenital Dislocation of Hip: investigation and management
Session 16 (Week 16)	Muscular dystrophy: Outline various forms, modes of inheritance and clinical manifestation; physical findings in relation to disabilities progression of various forms and prognosis, Describe medical management
Session 17 (Week 17	Spina bifida (meningomyelocele): Outline development; clinical features, lower limbs,
Session 18 (Week 18)	Bladder and bowel control; complications - U.T.I.
Session 19 (Week 19)	Hydrocephalus; outline medical treatment and surgical treatment.
Session20(Week20-24)	Still's disease: Classification, pathology in brief, physical findings, course & prognosis. Outline treatment, prevention and correction of deformity
Session21(Week25-26)	Acute C.N.S. infections: Classify (Bacterial and viral) and outline the

	acute illness, CNS sequelae leading to mental retardation, blindness, deafness, speech defect, motor analysis, bladder and bowel problems.
Session22(Week27-28)	Seizure disorder and specific problems such as subdural effusion, hydrocephalus, pressure sores, feeding difficulties.
Session23(Week29)	Revision and discussion
Session24(Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Medicine

1	**Course name**	**General Medicine**
2	**Course Code**	AI303
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2 units
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course will provide students with a fundamental understanding of the Knowledge of heart and lung anatomy and its functions, Knowledge of gastrointestinal diseases, Know the classifications of heart diseases, Knowing the circulatory system,Knowing the causes of shortness of breath.
Textbooks required for this Course:		• Internal medicine • Harrison's Principles of Internal Medicine, ed.20 by J. Larry Jameson; Dan L. Longo; Stephen L.

	Hauser; Dennis L. Kasper; Joseph Loscalzo; Anthony S. FauciTulane-subscribed resource. Login required from off-campus,2018 ISBN: 9781259644030 • Oxford Textbook of Medicine (6 edn) Get access ArrowJohn Firth (ed.), Christopher Conlon (ed.), Timothy Cox (ed.) 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion,
Course Objectives:	Upon completion of this course, the student will have reliably to: • Understand the functions of the heart • Identify the lung functions • Identify of the nature of the disease, including its causes, growth patterns, and consequences • Recognize the biological characteristics that distinguish each disease from the other. • Construct between lung functions and causes shortness of breath • Writing a report on the patient's condition • Work in a medical team
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam. A60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Anatomy of the lungs.
Session 2 (Week 2)	physiology of the lungs.
Session 3 (Week 3-4)	General overview : assessment in cardio respiratory dysfunction.
Session 4 (Week5)	Cardiac surgery 1. List the Cardiac conditions, required closed heart surgery.
Session5 (Week 6-7)	**Cardiac surgery:** List the cardiac conditions, required open heart surgery.
Session 6 (Week 8)	• Thoracic surgery
Session 7 (Week 9)	• Thoracic surgery
Session 9 (Week10)	• Thoracic surgery
Session9 (Week 11)	• Thoracic surgery
Session10 (Week 12)	**Midterm Exam**
Session11 (Week 13)	• Miscellaneous
Session12 (Week 14)	Miscellaneous
Session13 (Week 15-16)	Cerebrovascular accident
Session 15 (Week 17)	• Metabolic diseases
Session 16 (Week 18)	• Metabolic diseases
Session 17 (Week 19)	• Metabolic diseases
Session 18 (Week 20-23)	• Bleeding disorders
Session19(Week 24-27)	•Peptic ulcer disease, Hypertension and Inflammatory bowel disease

Session20(Week 28)	Revision and discussion
Session 21 (Week29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Surgery

1	**Course name**	**General Surgery**
2	**Course Code**	AI304
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022
Brief Description:	General surgery is a discipline of surgery having a central core of knowledge embracing anatomy, physiology, metabolism, immunology, nutrition pathology, wound healing, shock and resuscitation, intensive care, and neoplasia, which are common to all surgical specialties.	
Textbooks required for this Course:	• Farquharson's textbook of operative general surgery, 10th editionby brendan farquharson, margaret; hollingshead, james; moran 2014 • Textbook of Surgery, 4th Edition by Julian A. Smith , Andrew H. Kaye ,Christopher Christophi , Wendy A. Brown 2020	

	• Oxford Textbook of Fundamentals of Surgery by William E. G. Thomas (ed.), Malcolm W. R. Reed (ed.), Michael G. Wyatt (ed.) 2016 https://doi.org/10.1093/med/97 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation.
Course Objectives:	Upon completion of this course, the student will have reliably to: • know the diagnosis, preoperative, operative and postoperative management, including the management of complications. • Complete clinical evaluation of patients of common surgical problems • Carry out necessary investigations and interpret the results • Perform minor surgical procedures and treat minor surgical problems • Recognize the major surgical problems needing specialized care, • Provide competent primary care in surgical emergencies • Demonstrate the right attitude in Patient care, Community health care,Continuing medical education and research • Observing the moral and legal codes of medical ethics
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam. A60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction on general and plastic surgery
Session 2 (Week 2)	1. INFLAMATION AND INFECTION: a. Inflammation. b. Wounds and Wound healing.
Session 3 (Week 3)	c. Traumatic wounds. d. Soft-Tissue infection. e. Abscess and cellulitis
Session 4(Week 4)	2. COMMON SURGICAL PROBLEMS: a. Tumours. b. Cysts
Session 5 (Week 5)	ULCERS: a. Sinus and Fistulas. b. Gangrene.
Session 6(Week 6)	SHOCK: a. Definition, Types, etiology and Management.
Session 7(Week 7)	BURNS AND MANAGEMENT a. Classification of burns. b. Medical management of burns. c. Deformities due to burns. d. Prevention and treatment measures. e. Burns rehabilitation

Session 8 (Week 8)	GENERAL SURGERY AND GASTRO-INTESTINAL DISEASE: a. Acute Intestinal Obstruction.
Session 9 (Week9)	b. Nephrectomy, Appendicectomy, Herniorraphy, Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
Session 10(Week 10)	**Midterm Exam**
Session 11(Week 11)	DESCRIBE ABDOMINAL SURGICAL INCISIONS
Session 12 (Week 12)	POST- OPERATIVE COMPLICATIONS AND MANAGEMENT OF: Nephrectomy, Appendicectomy, Herniorraphy Mastectomy, Thyroidectomy,
Session 13(Week 13)	Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy
Session 14 (Week 14)	VASCULAR SURGERY: a. Varicose veins.
Session 15 (Week 15)	b. The post phlebetic limb. c. Amputations.
Session 16 (Week 16)	d. Deep Vein Thrombosis.
Session 17 (Week 17)	PULMONARY COLLAPSE: a. Pulmonary embolus. b. Burst abdomen.
Session 18 (Week 18)	c. Post- operative fistula.
Session 19 (Week 19)	d. Post- operative pyrexia.
Session 20 (Week 20)	POST- OPERATIVE FLUID AND ELECTROLYTE IMBALANCE
Session 21 (Week 21)	UROLOGICAL: a. Renal colic.
Session 22(Week 22)	CATHETIRIZATION: a. Circumcision. b. Haematuria.
Session 23 (Week 23)	NEUROSURGERY 1. NEUROANATOMY. 2. NEUROPHYSIOLOGY' CLINICAL FEATURES & MANAGEMENT. Cerebrovascular accident.
Session24(Week24-27)	HEAD INJURY. Diseases of the muscle: classification, signs, symptoms, progression and management. 2- Peripheral nerve disorders.
Session 25 (Week28)	Revision and discussion
Session 26 (Week29-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Good organizational ability and effective decision making skills. Excellent communication skills to deal with a wide rang of colleagues, patients and their families.

	Emotional resilience, a calm temperament and the ability to work well under pressure. Physical stamina to cope with the demands of surgery. The ability to lead and manage a team effectively.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Diagnostic Investigation

1	**Course name**	**Diagnostic Investigation**
2	**Course Code**	AI305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will provide students with a fundamental understanding of the nature of medical investigations: laboratory, radiological, electrical, etc. Definition: Group of investigations advised by the treating doctor to get diagnosis and treatment of the disease. - Diagnostic test: refers to the various methods used to assess body structures and function to determine the presence or absence of a definite disease and nature of the disease if present. - Objectives of the diagnostic test: - To determine any abnormality. - Used to follow up the cases. - To help the physician [DR] in diagnosis and treatment. - Classifications:	
Textbooks required for this Course:	• McPhee, S. J., Papadakis, M. A., & Rabow, M. W. (2014). Current medical diagnosis & treatment 2014. 53rd ed. New York: McGraw-Hill Medical • Differential diagnosis and medical therapeutics:a treatise on clinical by rao,psrk – 2011 • EKG | ECG Interpretation Made Easy: An Illustrated Study Guide For Students To Easily Learn How To Read & Interpret ECG Strips • Interpreting ECGs: A Practical Approach Paperback • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.	

Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, hospital training....etc.
Course Objectives:	Upon completion of this course, the student will have reliably to: • Understand various types of medical investigations • Identify type of device used for the health problem • Recognize the status of the patient • Identify representations, terms, conditions, and clinical examination. • Recognize different type of disease • Construct good information about medical device • Write clinical examination for health problem • Develop thestudent skills to choose appropriate patient examination • Implement some medical investigation at hospital
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam. A60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to medical investigation • Types of medical investigation
Session 2 (Week 2)	• Aims of medical investigation
Session 3 (Week 3)	• Classification of medical investigation • Diagnostic test
Session 4 (Week 4)	• Laboratory investigation
Session 5 (Week 5)	• Urinalysis
Session 6 (Week 6)	• Methods of collecting urine
Session 7 (Week 7)	• Blood investigation
Session 7 (Week 8)	• Complete blood count, erythrocyte sedimentation rate
Session 7 (Week 9)	• The chemistry panel , blood glucose , FBS indicate
Session 10 (Week 10)	**Midterm Exam**
Session 11 (Week 11)	• uric acid test, creatinine test, electrolyte test
Session 12 (Week 12)	• liver function test
Session 13 (Week 13)	• blood test
Session 14 (Week 14)	• blood gases test
Session 15 (Week 15)	• cardiovascular system, heart function
Session 16 (Week 16)	• Types of cardiovascular disease and reducing the risk for cv disease
Session 17(Week 17)	Cardiovascular disorders) • Cytology.
Session 18(Week 18)	Medical investigation of gastrointestinal system.
Session 19(Week 19)	Medical investigation of urinary system disorder.
Session 20 (Week 20)	- - Medical investigation of respiratory system.
Session 21 (Week 21-25)	- Medical investigation of central nervous system. - Medical investigation of cardiovascular system.
Session 22 (Week 26-27)	Medical investigation of bone diseases. Medical imaging
Session 23 (Week 28)	Revision and discussion
Session 24 (Week29 - 32)	**Final Exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pharmacology

1	**Course name**	**Pharmacology**
2	**Course Code**	**MT306**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide how a drug affects a biological system and how the body responds to the drug. The discipline encompasses the sources, chemical properties, biological effects and therapeutic uses of drugs.
Textbooks required for this Course:	• Essential of general pharmacology book.Lippincott's Illustrated Reviews: pharmacology book.Pharmacology and drug administration for imaging technology book. • Basic Pharmacology Understanding Drug Actions and Reactions By Maria A. Hernandez,., Appu Rathinavelu, 1st edition 2006. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.

	• A Textbook of Clinical Pharmacology and Therapeutics, 5th By James Ritter, Lionel Lewis, Timothy Mant, Albert Ferro 2008 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based.Group interaction and discussion. self-directed activities. Active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire new knowledge in pharmacology by conducting and promoting innovative research. • Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs. • Report the clinical applications, side effects of drugs used in medicine. • Translate pharmacological principles into clinical decision making.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	C. General pharmacology: • Introduction. • Drug sources. • Routes of drug administration. • Pharmacokinetics.
Session 2 (Week 2)	E. General pharmacology: • Pharmacodynamics. • Drug adverse effects and toxicity. • Drug-drug interactions.
Session 3 (Week3)	F. Autonomic nervous system: • Introduction. • Sympathomimetics. • Sympathetic depressants.
Session 4 (Week4)	B. Autonomic nervous system: • Parasympathomimetics. • Parasympathetics depressants.
Session 5 (Week5)	B. Autonomic nervous system: • Drug acting on autonomic ganglia. • Skeletal muscle relaxants. • Drug acting on the eye.
Session 6 (Week 6	C. Autacoids: • Histamine & serotonine. • Prostaglandins & eicosanoids. • Vasoactive peptides.
Session7 (Week 7)	D. Central nervous system: • Introduction. • Sedative & hypnotics.

Session8 (Week 8)	D. Central nervous system: • Analgesics and antipyretics & NSAID. • Narcotic analgesics. • Anticonvulsants & antiepileptics
Session9 (Week 9)	D. Central nervous system: • Antiparkinsonian drugs. • Antipsychotics and antianxiety & antidepressants. • Local & general Anaesthetic.
Session10 (Week 10)	E. Cardiovascular system: • Antihypertensive & antishock drugs. • Cardiac glycosides and congestive heart failure. • Antiarhythemic drugs. • Drugs used in angina pectoris.
Session 11 (Week 11)	Topics to be covered in the session (week12) F. Blood: 1. Coagulants, anticoagulants, fibrinolytics & antiplatelets. 2. Drugs used in treatment of anemia. 3. Drugs used in treatment of hyperlipidemia.
Session 12(Week 12)	G. Chemotherapy: • Sulphonamides & quinolones. • B-lactum antibiotics (penicilins, cephalosporins).
Session 13 (Week 13)	G. Chemotherapy: • Chloramphenicol & tetracyclines. • Aminoglucosides antibiotics. • Antifungal drugs
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	G. Chemotherapy: Antiviral drugs, Antituberculus, Antimalarial drugs & antiprotozal.
Session 16 (Week 16)	H. Endocrie drugs: Antidiabetics drugs and Antithyroid drugs.
Session17 (Week 17)	H. Endocrie drugs: • Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).
Session 18 (Week 18)	H. Endocrie drugs: • Corticosteroids. • Sex hormones, contraceptives drugs.
Session 19 (Week 19)	I. Respiratory system: • Drugs used in treatment of bronchial asthma.
Session 20 (Week 20)	I. Respiratory system: • Cough therapy. * Gas therapy
Session 21(Week 21)	J. GIT: • Drugs used in treatment of peptic ulcer • Antiemetic drugs.
Session22(Week22-23)	J. GIT: • Drugs used in treatment of constipation and diarrhea. • Antispasmodics.
Session23(Week23-28)	K. Urinary tract: 1. Diuretics. 2. Urinary tract infection.
Session24(Week29)	Revision and discussion
Session25(Week 30)	**Final exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب - المقررات الدراسية للسنة الرابعة قسم تقنية التخدير

Anesthesia

1	**Course name**	**Anesthesia**
2	**Course Code**	**AI401**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding how to use medication that prevents people from feeling pain during or following surgery. This course will provide students known the type of anesthesia .the type of anesthetic a person receives may vary according to the kind of medical procedure they require and their individual health needs.
Textbooks required for this Course:	• Miller´s Anesthesia : International Edition Volume 1 Hardcove • Clinical Anesthesia Paul G. Barash Lippincott Williams & Wilkins, 2009 • Oxford Textbook of Anaesthesia by Jonathan G Hardman (ed.), Philip M Hopkins , Michel M.R.F Struys 2017, https://doi.org/10.1093/med/97 • Anesthesiology, Third Edition by Sean Mackey; David E. Longnecker; Mark F. Newman; Warren M. Zapol; Warren Sandberg 2017 • Basics of Anesthesia by Manuel Pardo; Ronald D. Miller 2017 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments
Course Objectives:	Upon completion of this course, the students will have the ability to: • Understand the safe anesthesia techniques for various elective and emergency procedures in and outside the operation theatre. • Obtain knowledge about the proper functioning of various anesthetic equipment's such as the work station, anesthesia monitors, syringe pumps

	• Recognize different types of anesthetic drugs and loading of drugs. • Understand the basic skills of cardiopulmonary resuscitation, post-operative and intensive care unit management. • Recognize to prepared and maintained patient monitoring devices and anesthesia delivery systems before, during and after anesthesia. • Checking the emergency drug tray, defibrillator, difficult airway cart.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1(Week 1-2)	• Introduction to **Anaesthetic Equipment's** The Anaesthetic machine. Anaesthetic breathing systems Monitoring in Anaesthesia Airway management Patient position during operation
Session 3 (Week3)	Special Anesthesia: ➢ Obesity ➢ Pediatric Anaesthesia ➢ Anaesthesia for the obstetric patient ➢ Anaesthesia for laparoscopic surgery ➢ ENT Anaesthesia Orthopedic Anaesthesia .....
Session 4 (Week 4-6)	Basic concepts in Regional Anaesthesia Post-operative complications (early & late complications) ▪ Respiratory complication ▪ Cardiovascular complication ▪ Nausea and vomiting ▪ Malignant hyperthermia.
Session5 (Week 7)	Emergency Anaesthesia & Anesthesia for traumatic patient Perioperative & postoperative fluid therapy in the adult
Session 6(Week 8 -11)	Anaesthetic Equipment's Anaesthetic machine Airway equipment's Monitoring system <u>Anaesthetic machine:</u> The purpose of Anaesthesia Machine Main components of AM including the following in details Anaesthetic delivery system Supply of gases, Flow meter and Vaporizer
Session 7 (Week 12)	**Midterm Exam**
Session 8 (Week 13)	Breathing Systems 'patient breathing circuit'

	Breathing systems are known as 'Anaesthetic Circuits' previously classified as: open circuit &Semi open circuit close circuit &semi close circuit
Session 9(Week 14 -16)	The most useful classification of breathing circuit is: Non-rebreathing, Partial re-breathing rebreathing (circle) Other component of breathing system such as: Unidirectional valves, reservoir bag, oxygen flush valve, pop-off valve, regulator and co2 Absorber.
Session 10 (Week 17 -18)	**Scavenging system** →(using to expel of waste of anaesthetic gases) **Ventilator:** Minute volume driver , Bag squeezer
Session11(Week 19 -22)	Airway equipment's: Laryngoscope: types ,structure and main function Facemasks: types and function Simple adjuncts including: Intubating Oral Airways (IOA) or oropharyngeal airway Nasopharyngeal airway The main function of each type Method of insertion and technique Complications Contraindications
Session 12(Week 23 -24)	Endotracheal Tube (ETT) Types of ETT Size of ETT: internal diameter (ID) and Depth of insertion Technique of insertion ETT including: Oral-endotracheal intubation Nasal-endotracheal intubation; Advantages , Disadvantages Contraindications (NTI) Indications of ETT Complication of ET Intubation during, while intubation and during extubation.
Session 13(Week 25)	**Supraglottic Airways:** **Combitube:** Laryngeal Mask Airway (LMA) and Intubating LMA (ILMA), LMA – Fastrach (intubating LMA). Explain the main structure and function of each device and identify the different between them. Give the advantaged and disadvantages, indication, contraindicated and complication for each one.
Session 14 (Week 26)	Other Equipment's used for Airway management: Stilette Intubation Forceps; the most common used Magill forceps. Laryngeal spray Suction Apparatus explain structure, function and types. Explain main function of the other equipment could be found in Anaesthetic table such as: Syringe, Lubricating jelly and Dynaplast/ tape.
Session 15 (Week 27 - 28)	Monitoring in Anaesthesia Introduction Individual System Monitoring; including the following: Position of ETT.

	Respiratory System; including O2 Saturation, Capnography EtCO2, Airway pressure and ABG samples. CVS & Hemodynamic Monitoring. CNS: Awareness. Temperature. Monitoring after Extubation & Recovery D. Air way management Aims of Preoperative airway assessment Evidences of difficult airway How to examine and assist airway in the preoperative period? Such as : Good history taken Some examination could be done such as:
Session 16(Week 29)	Revision and discussion
Session 17(Week 30 - 32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. - Good communication and people skills. - Able to work under pressure. - Good technical and measurement skills. - Able to cope with the physical demands of the job.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Intensive care

1	**Course name**	**Intensive care**
2	**Course Code**	**AI402**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	4 units
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	The normal pre-requisite will be completion of B.S core models
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of intensive care therapy introduce some of the key concepts and terminology regarding the care of critically ill patients. Demonstrate knowledge of the following equipment: Endotracheal tubes. Tracheostomy tubes, Humidifier, ventilators, High frequency ventilators, Differential ventilators, CPAP masks, Suction pump, Electrocardiogram, Pressure monitors - arterial, central venous, pulmonary artery, Pressure monitors - arterial, central venous, pulmonary artery and pulmonary wedge: intracranial and temperature monitors, CPR. Assess: Special instructions pertaining to any operation performed, respiration, level of consciousness, color - blood pressure, pulse temperature, sputum, expectorated (color and quantity), drugs (time last dose of analgesic given), drains, presence of Pacemaker or Intra aortic balloon pump, ECG and blood gas results.
Textbooks required for this Course:	• The Beginner's Guide to Intensive Care. A Handbook for Junior Doctors and Allied Professionals.2nd Edition, Edited By Nitin Arora, Shondipon K. Laha • Atlas of Anesthesia: 8-Volume Set 1st Edition, by Ronald D. Miller MD MS (Editor), Robert R. Kirby MD Debra A. Schwinn MD • Clinical anesthesia textbook. Paul Barash, Bruce Cullen, Robert K. Stoelting 6th edition • The Intensive Care Unit Manual: Expert Consult - Print (Expertconsult.com) 2nd Edition by Paul N. Lanken MD ,Scott Manaker MD PhD Benjamin A. Kohl MD FCCM (Author), C. William Hanson III MD

	• Textbook of Critical Care: First South Asia Edition Hardcover, 2007 • by Mitchell P. Fink Jean-Louis Vincent ,Edward Abraham ,Frederick A. Moore Patrick Kochanek (Author) • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	6 * 28 = 168 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion "Case Based Discussion [CBD]" C Laboratory experiments D Direct Observation of Procedural Skills [DOPS] E Examination S Simulation Hospital training within "intensive care unit "
Course Objectives:	Upon completion of the course students should be able to: • Understand acute and critical care practice and are involved in the care of acutely/critically ill patients. • Demonstrate and apply a thorough knowledge of the physiology and relevant pathophysiology underlying the assessment of acutely/ critically ill adults • Recognize critically appraise and demonstrate effective teamwork and communication strategies necessary for ensuring safe care and practice • Understand systematic clinical assessments; monitoring and interpretation of assessment findings • Recognizing acute cardiac care and rhythm interpretation • Writing report in acute respiratory care and blood gas analysis • Know fluid and electrolyte balance, hydration and nutritional support • Know sepsis and shock • Deal with pain assessment and managemen • Recognizing acute medical emergencies • Making clinical decision; Risk, patient safety
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to intensive care unit ▪ History of INTENSIVE Care
Session 2 (Week 2)	What is intensive care?
Session 3 (Week 3)	• Monitoring in intensive care ✓ Monitoring Classification according to target parameters ✓ Interpretations of values for reading component
Session 4 (Week 4)	• Monitoring in intensive care

	✓ Monitoring Classification according to target parameters
Session 5(Week 5)	• Monitoring in intensive care ✓ Interpretations of values for reading component
Session 6(Week 6&7)	• Acid –Base balance and imbalance ✓ Interpretations of ABGanalysis ✓ Define cases of imbalance
Session 7 (Week 8)	• Acid –Base balance and imbalance ✓ Define cases of imbalance
Session 8 (Week 9&10)	• Respiratory Failure ✓ Identify types of RF and causes ✓ Investigation
Session 9(Week 11)	✓ Management of Respiratory Failure (RF)
Session 10 (Week 12)	**Midterm Exam**
Session 11(Week 13)	• Mechanical Ventilation TYPES /MODES.
Session 12(Week 14)	• Mechanical Ventilation ELEMENTS/ USES
Session 13(Week 15)	•Renal failure
Session 14(Week 16)	hepatic Failure
Session 15 (Week 17)	• Cardiopulmonary resuscitation1
Session 16 (Week 18)	• Cardiopulmonary resuscitation2
Session 17 (Week 19)	• Shock; types & management & treatment
Session 18 (Week 20)	• Sedative and Analgesics & pain management in intensive care.
Session 19 (Week 21 -28)	• Vasopressors & inotropes drugs • Intravenous Fluid therapy and Nutrition • Blood transfusion • Patients Transportation
Session 20 (Week 29)	Revision and discussion
Session 21(Week30 -32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Emergency Medicine

1	**Course name**	**Emergency Medicine**
2	**Course Code**	**AI403**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	The normal pre-requisite will be completion of B.S core models
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of theKnowing the functions of the heart, arteries and lungs, Know the classifications of heart diseases.
Textbooks required for this Course:	• Rosen's Emergency Medicine: Concepts and Clinical Practice, Sixth Edition, 3 volume set Hardcover – January 1, 2006 by John A. Marx , Robert S. Hockberger, Ron M. Walls • Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 8th edition 8th Edition by Judith Tintinalli , J. Stapczynski , O. John Ma , Donald Yealy , Garth Meckler , David Cline 2015 • Roberts and Hedges' Clinical Procedures in Emergency Medicine (Roberts, Clinical Procedures in Emergency Medicine) 6th Edition by James R. Roberts MD FACEP FAAEM FACMT 2013 • Emergency Medicine Procedures, Second Edition 2nd Editionby Eric Reichman 2013 • Textbook of Adult Emergency Medicine by Peter Cameron, Mark Little, Biswadev Mitra, Conor Deasy 5th Edition - May 23, 2019 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments
Course Objectives:	Upon completion of this course, the student will have the ability to: • Understand the functions of the heart • Identify the lung functions • Recognize the types of high blood pressure and diabetes • Identify representations, terms, conditions,

	• Recognize different between heart disease and diabetes • Construct between lung functions and causes shortness of breath • Writing a report on the patient's condition • Work in a medical team .
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Diabetic Ketoacidosis What are the Warning Signs of DKA? How Do I Check for Ketones? What Causes DKA? Symptoms, diagnosed & management and treatment.
Session 2 (Week 2 - 4)	Hyperglycemia and Hypoglycemia Definition Signs and symptoms; Central nervous system& Long-term effects The most common cause of hypoglycemia Serious illness, Hormone deficiency, Pathophysiology and Diagnosis
Session 3 (Week 5)	Method of measurement and Age Differential diagnosis, Prevention and Treatment
Session 6 (Week6)	Asthma ASTHMA OVERVIEW Signs and symptoms Associated conditions Causes; Environmental, Genetic and Medical conditions Pathophysiology
Session 7 (Week 7)	Diagnosis, Differential diagnosis and Prevention Management; Lifestyle modification, Medications Others and Alternative medicine
Session 8 (Week 8)	• Hemoptysis (Differential diagnosis, Diagnosis and Treatment)
Session 9 (Week9)	Revision
Session 10 (Week10)	**Midterm Exam**
Session 11 (Week11 - 12)	Acute Respiratory Failure ▪ Definition ▪ Types of Acute Respiratory Failure ▪ Causes Acute Respiratory Failure ▪ Risk Factors ▪ Diagnosing Acute Respiratory Failure ▪ Treating Acute Respiratory Failure
Session 12 (Week 13 -14)	• Cardiac Rhythm Treatment
Session 13(Week 15 - 16)	• Sudden Cardiac Collapse Definition of Sudden cardiac arrest , Symptoms and causes Heart conditions that can lead to sudden cardiac arrest Risk factors, Diagnosis and treatment
Session 14 (Week17 - 20)	Hepatitis Definition and The 5 Types of Viral Hepatitis Causes of Hepatitis and Common Symptoms of Hepatitis

	How Is Hepatitis Diagnosed? Treatment and Prevent Hepatitis Complications of Hepatitis
Session 15 (Week 21)	Revision
Session 16 (Week22 - 27)	Hypertension & Hypotension Causes, Symptoms, Diagnosis and treatment Jaundice • Signs and symptoms & Complications Differential diagnosis; Pre-hepatic , Hepatocellular, Post-hepatic and Management & treatment
Session 17(Week28)	Revision and discussion
Session 18(Week29-30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Emergency Surgery

1	**Course name**	**Emergency Surgery**
2	**Course Code**	AI404
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2 units
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	The normal pre-requisite will be completion of B.S core models
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	Emergency surgery can be defined as surgery that is required to deal with an acute threat to life, organ, limb or tissue caused by external trauma, acute diseases process, acute exacerbation of a chronic diseases process, or complication of a surgical or other interventional procedure.	

Textbooks required for this Course:	• https://rlmc.edu.pk/themes/images/gallery/library/books/Surgery/Adam_Brooks,_Bryan_A._Cotton,_Nigel_Tai,_Peter_F._Mahoney_Em.pdf • Emergency Surgery by Adam J. Brooks, Bryan A. Cotton, Nigel Tai, Peter F. Mahoney 2010 • Emergencies in Clinical Surgery Chris Callaghan (ed.), J. Andrew Bradley (ed.), Christopher Watson (ed.) https://doi.org/10.1093/med/97 • Trauma and Emergency Surgery - The Role of Damage Control Surgery by Georgios Tsoulfas and Mohammad Meshkini DOI 10.5772/intechopen.87629 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation.
Course Objectives:	Upon completion of this course, the student will have the ability to: • Undertake those abdominal (including urological), thoracic, vascular, and soft tissue procedures that need to be performed within 24 hours. • Assess the need for surgery, know when to involve from other specialist surgeons, and be able to perform the life saving procedures as above. • Deal quickly with problems that can be life- threatening.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction on emergency surgery
Session 2 (Week 2 - 4)	Upper and lower Gastrointestinal Bleeding Definition, Epidemiology, Pathophysiology.Investigations. Causes Types according to source Investigations Management & treatment ; General and Emergency surgery related to U/LGITB
Session 4 (Week 5 - 7)	Traumatic Brain Injury (TBI) - Definition, Epidemiology, Pathophysiology Glasgow Coma Scale for adult Classification and Complications of Traumatic Brain Injury Classification Primary and secondary injuries Focal and diffuse injuries Measures of severity Complications
Session5 (Week 8 - 10)	Head Injury

	Spinal injuries, musculoskeletal injuries, and Eye injuries). Crush Injuries. Burns. Electrical Injuries. Stab Injuries. Anaesthesia considerations in penetrating trauma.
Session 6 (Week 11)	Emergency anaesthetic management of cardio-thoracic & abdominal injury Gunshot Injuries
Session 7(Week 12)	**Midterm Exam**
Session 8(Week 13 -15)	Neurosurgery for Cerebral Aneurysm Definition, Epidemiology, Pathophysiology. Causes Investigations. Management & treatment ; General and Emergency surgery related
Session 9 (Week 16)	Neurosurgery for Cauda Equina Syndrome Definition, Epidemiology, Pathophysiology. Causes Investigations.
Session 10 (Week 17)	Neurosurgery for Hydrocephalus. Definition, Epidemiology, Pathophysiology. Causes Investigations.
Session11(Week 18 - 19)	Neuromodulation Surgery for Psychiatric Disorders. Definition, Epidemiology, Pathophysiology. Investigations
Session 12 (Week 20)	Revision
Session 13(Week 21 - 22)	Neuromodulation Surgery for Psychiatric Disorders. Management & treatment ; General and Emergency surgery related. Diagnosis.
Session14(Week 23 - 24)	Stereotactic Surgery in Parkinson Disease Definition, Epidemiology, Pathophysiology. Investigations
Session15 (Week 25 - 27)	Stereotactic Surgery in Parkinson Disease Management & treatment ; General and Emergency surgery related. Diagnosis.
Session 16 (Week 28)	Revision and discussion
Session 17 (Week 29 -30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Good organizational ability and effective decision making skills. Excellent communication skills to deal with a wide rang of colleagues, patients and their families.

	Emotional resilience, a calm temperament and the ability to work well under pressure. Physical stamina to cope with the demands of surgery. The ability to lead and manage a team effectively.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Obstetrics & Gynecology

1	**Course name**	**Obstetrics & Gynecology**
2	**Course Code**	**AI405**
3	**Course type: /general/specialty/optional**	**specialty**
4	**Accredited units**	2 units
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	The normal pre-requisite will be completion of B.S core models
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	At the end of this course the studet will be able to describe and recognize the essentials of gynecology and obstetrics concepts.
Textbooks required for this Course:	• Oxford Handbook of Obstetrics and Gynaecology (Oxford Medical Handbooks) 3rd Edition by Sally Collins, Sabaratnam Arulkumaran, Kevin Hayes, Simon Jackson, Lawrence Impey 2013 • Obstetrics and Gynecology PreTest Self-Assessment and Review, 14th Edition. Shireen Madani Sims • Obstetrics & Gynecology. Susan Raatz Stephenson Ma.ed. bsrt-u rdms rvt • Netter's Obstetrics, Gynecology & Women's Health. Roger P. Smith gregory.ginsberg.uphs.upenn.edu • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based Group interaction and discussion
Course Objectives:	At the end of the course, it is expected that the student should be able to : • Understand normal physiology of pregnancy • Identify the principles for antenatal controls and risk estimation of pregnancy and delivery

	• Recognize pregnancy complications including multiples, fetal growth abnormalities and infections • Identify representations, terms, conditions of medical disorders in pregnancy including hypertensive disorders, diabetes and epilepsy • Understand complications in early pregnancy including spontaneous abortion, ectopic pregnancy and molar pregnancy. • Recognized the major problems that required applied anesthesia (general, regional and local anesthesia)
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	SECTION 1 OBSTETRICS • Introduction to gynecology
Sesstion2 (week 2)	• Anatomy of the normal female pelvis.
Session 3 (Week3)	• Anatomical and physiological changes during pregnancy.
Session4 (week4)	Topics to be covered in the session (week) • Antenatal care: • Antenatal education.
Session 5 (Week5)	• Aims of adequate antenatal care. • Psychological preparation for pregnant woman
Session 6 (Week6)	•Medical antenatal care for normal pregnant woman 1 (objectives, frequency of Examinations and reassurance & advices
Session 7(Week7)	• Medical antenatal care for normal pregnant woman 2 (objectives, frequency of Examinations and reassurance & advices
Session 8(Week8)	• Risk pregnancy. 1. Pregnancy related hypertension.
Session 9(Week9)	2. Diabetes and pregnancy.
Session 10(Week10)	**Midterm Exam**
Session 11(Week11)	• Cardiac disease in pregnancy. • Asthma and pregnancy.
Session 12(Week12)	• Normal labour. • Episiotomy (prineotomy).
Session 13(Week13)	• Forceps delivery.
Session 14(Week 14)	• Normal puerperium. I. Abnormal puerperium and post-natal problems.
Session 15(Week 15)	Cesarean section (CS).
Session 16(Week 16)	**Section -----2 Gynaecology** A. Anatomy of the female genital tract.
Session 17(Week 17)	B. Anatomy of the lower urinary tract.
Session 18 (Week18 - 25)	C. Urinary incontinence (UI). D. Displacements of the uterus. E. Retroversion and retroflexion of the uterus. F. Dysmenorrhea.

	G. Hysterectomy.
Session 19 (Week26 - 28)	H. Menopause. I. Chronic Pelvic Pain (CPP).
Session 20(Week26 - 28)	Revision and discussion
Session 21 (Week 30 -32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pain Management

1	**Course name**	**Pain Management**
2	**Course Code**	**AT406**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	**4 hours per week**
6	**Pre-requisite requirements**	**Principles of Anesthesia**
7	**Program offered the course**	Anesthesia Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will assist learners to develop approaches to the global assessment of the patient with pain (acute and chronic) to guide diagnosis, care and treatment and the identification of complex cases. This will include conventional health assessment techniques (interview and physical examination), pain assessment tools, psychosocial assessment, specific techniques (e.g. examination of lumbar spine, functionality assessments), and the role and value of diagnostic studies.
Textbooks required for this Course:	• Churchill's Pocketbook of Pain. By Catherine F. Stannard and Sara Booth. Philadelphia, Churchill Livingstone,uk ,2008- 4TH Edition • Smith and Aitkenhead's Textbook of Anaesthesia, 7th Edition • Churchill's Pocketbook of Pain Managemen. Thomas, P. Sebastian MD • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 8 28 = 112 teaching hours
Delivery	Lecture-based ppt and practical training Group interaction and discussion "Case Based Discussion [CBD]", Laboratory experiments, Direct Observation of Procedural Skills [DOPS], Examination and Simulation Hospital training within "intensive care unit "
Course Objectives:	Upon completing this course, participants should be able to: • Recognize features of complex, persistent pain in a patient presentation. • Recognize health and cultural factors that can influence the experience of pain. • Use consistent messaging to explain how pain works and the brain's role in how we experience pain. • Access patient education resources and use shared decision making with patients to plan healthy life-style changes.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Introduction to the pain management** • Understand the definitions of chronic pain and terms used in chronic pain assessment and management, know epidemiology of chronic pain, understand complexity of chronic pain
Session 2 (Week 2)	• **Understanding the pain experience**: Diagnosis and assessment for the whole person
Session 3 (Week 3)	An in depth introduction into the 'whole person' pain experience from world class authors. 3 parts: • Making an effective pain diagnosis: a whole person approach

Session 4 (Week 4)	• The impact and management of psychological factors in pain
Session 5(Week 5)	• A whole person approach to acute and chronic pain
Session 6(Week 6)	Review of types of pain • Review some definitions related to pain, discuss limitations for patients unable to self-report and suggest an alternative definition for pain.
Session 7 (Week 7)	• Describe the types of pain (acute, chronic, nociceptive, neuropathic), and be able to relate them to the patient condition
Session 8 (Week 8)	Pre-treatment evaluation I • Obtain a history and physical examination, including musculoskeletal status, and, at a minimum,note all laboratory, radiographic and pertinent studies that may affect planned pain managementprotocols and modalities.
Session 9(Week 9)	Pre-treatment evaluation II • Obtain a history and physical examination, including musculoskeletal status, and, at a minimum,note all laboratory, radiographic and pertinent studies that may affect planned pain managementprotocols and modalities.
Session 10 (Week 10)	Basics of Chronic Pain Management Safety and Monitoring. • Complete a pre-procedure examination of all therapeutic equipment and medications (andincluding, as appropriate, the anesthesia machine and related monitoring devices
Session 11(Week 11)	Analgesic Medications or Pharmacology of pain medicine • Define and describe the pharmacodynamics, pharmacokinetic, physiological, and postoperativeeffects of all agents used in pain medicine clinical practice as well as appropriate druginteractions.
Session 12(Week 12)	• Understand and describe the State and National guidelines for prescribing • controlled substances for pain. • different mechanisms of action can achieve a better outcome
Session 13(Week 13)	• Understand the basic physiology of the pain pathway. • Describe where and how different types of pain medicine target this pathway.
Session 14(Week 14)	• Explain how different pain medications target specific types and aspects of pain. • Understand how combining pain medications with
Session 15 (Week 15)	**Midterm Exam**
Session 16 (Week 16)	Airway Management • Be able to maintain an oral, oropharyngeal and/or or tracheal airway.
Session 17 (Week 17)	Spinal, Epidural, and Regional Analgesia/Anesthesia I Describe appropriate patterns of regional anesthesia usage, including indications.
Session 18 (Week 18)	Spinal, Epidural, and Regional Analgesia/Anesthesia II Contraindications, principles of use, physiological effects, medications, basic techniques, properdosage, as well as recognition of the manifestations of toxicity.

Session19(Week19-25)	Psychological • Understand and describe the principles of multimodal and interdisciplinary pain management including psychological, physiotherapy, and rehabilitation evaluations and treatment options. Pain Management: An integrated approach for the clinical setting: • With interactive case studies, doctor/patient videos and dedicated learning assessments, this self-paced pain management including: - Identification and management of neuropathic pain in the primary care setting - Identification and management of low back pain in the primary care setting - Non-joint musculo-skeletal pain - Post-discharge acute pain management - Understanding pain-related procedures - Pain in children - Cancer pain ,,etc.
Session26(Week26-28)	Psychometrics of Pain Assessment Tools Reliability - Describe the main steps of scale development Describe the term reliability Identify various strategies to test reliability and relate them to different types of pain assessment tools Adequately interpret coefficients related to reliability testing Validity- Describe the term validity in accordance with the current measurement guidelines PowerPoint lecture, assigned readings Identify various strategies to test validity and relate them to different types of pain assessment tools Identify strengths and limitations of these strategies
Session27 (Week29)	Revision and discussion
Session 28 (Week29-30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

سابعا: المقررات الدراسية لقسم الأجهزة والمعدات الطبية

أ - المقررات الدراسية للسنة الثانية قسم الأجهزة والمعدات الطبية

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain.

	• Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder) • Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color

	• Receptors and glands • Skin burns and disorders • Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy

	and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis.

	• The metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science. • The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3-4)	• Body fluids of the cell
Session 4 (Week 5 - 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 - 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 - 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 - 23)	•Carbohydrate Metabolism
Session18(Week 24 - 25)	•Lipid metabolism
Session19(Week 26 - 27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal

	communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and relate the functions and the anatomy and histology of each organ system.

	• Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪ ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle • Action potential •Excitation- contraction coupling

	• Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain and Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses, Gustation and Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex
Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	**Urinary system** • The kidney, Urine formation, Micturition and Renal failure

	• Male reproductive and Female reproductive
Session26 (Week 27,28)	Endocrine System, Pituitary gland, Thyroid gland, Parathyriod, Adernal gland and Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised..

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health	

	promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985. • Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be famillar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods

	• Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell
Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions.

	• Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people.

	• Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**
Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	This course introduces medical technology students to the field of medical ethics. The objective of the course is: • To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner

	• Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 6. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others; • Learn to select, use, and critically analyze current HCMN research and literature;

	• Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources
Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.

Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Mathematics

1	**Course name**	**Mathematics**
2	**Course Code**	DE207
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will provide students with a fundamental understanding of the nature of mathematical foundation and provide a common for students in all of the programs, drawing upon the full range of undergraduate courses in mathematics. Mathematical connection will be emphasized in the course,	
Textbooks required for this Course:	The following are texts suitable for this course: • Dunham, william, journey through genius, john wiley & sons, inc., nyc,1990.	

	• Eves, howard, foundations and fundamental concepts of mathematics, pws-kent publishing co., boston, ma, 1991. kurtz, david, foundations of abstract mathematics, mcgraw hill publishing co., hightstown, nj, 1992. morash, ronald, bridge to abstract mathematics, mcgraw hill publishing co., hightstown, nj, 1991. • Lial, Greenwell, and Ritchey, Finite Mathematics, 11th edition, Pearson Education, 2016 (ISBN: 978-0-321-97943-8). • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	By the end of the course, students should be able to: • Develop a positive attitude towards learning Mathematics • Perform mathematical operations and manipulations with confidence, speed and accuracy • Think and reason precisely, logically and critically in any given situation • Develop investigative skills in Mathematics • Identify, concretise, symbolise and use mathematical relationships in everyday life • Comprehend, analyse, synthesise, evaluate, and make generalizations so as to solve mathematical problems • Collect, organize, represent, analyse, interpret data and make conclusions and predictions from its results • Apply mathematical knowledge and skills to familiar and unfamiliar situations • Appreciate the role, value and use of Mathematics in society • Develop willingness and work collaboratively • Acquire knowledge and skills for further education and training • Communicate mathematical ideas • Emphasize mathematical connection, allowing them to relate topics studied separately to one another • Understand the mathematical reasoning and communication skills, as applied to mathematics • Build upon and share knowledge already acquired while pointing out areas in which additional study may be needed • Develop the communication skills and understanding of the process of doing mathematics necessary for graduate-level study.
Course Assessments	Midterm Exam 20% Activities 10% Attendance 10% 60 % Final exam. A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and

	design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	develop a linear model (A, B)
Session 2 (Week 2)	develop a model of a linear system (A, B)
Session 3 (Week 3)	graph lines, inequalities, and the solution set for a system of inequalities (A,B)
Session 4 (Week 4)	perform matrix arithmetic and determine the inverse of a matrix (C)
Session 5 (Week 5)	solve linear equations and systems of linear equations using Gaussian elimination (C)
Session 6 (Week 6)	develop a model for simple linear optimization problems (A, B)
Session 7 (Week7-12)	solve linear programming problems, graphically and via the Simplex Method (C, D), analyze final simplex tableaus for linear optimization problems (D). use correctly the addition and multiplication counting principles (C, D), solve standard probability problems which make use of the counting principles (C, D)
Session 8 (Week 13)	**Midterm Exam**
Session 9(Week 14-17)	identify and compute probabilities for mutually exclusive or independent events (B,C)
Session 10 (Week18-21)	solve standard probability problems involving inclusion / exclusion, conditional probabilities, Bayes Theorem (B, C)
Session 11 (Week 22)	develop probabilistic models for stochastic processes (A, B) develop models for Markov processes (A, B)
Session 12 (Week 23)	analyze transition matrices to determine expected time to absorption and probabilities of absorption in a Markov process (C,D)
Sessio13(Week 24 -28)	develop models for n x m 2-person zero-sum games (A, B) 17. analyze payoff matrices to determine optimal strategies in 2-person zero-sum games (C,D)
Sessio14(Week 29)	Revision and discussion
Session 15(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Logical Design

1	**Course name**	**Logical Design**
2	**Course Code**	**ME208**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the logic design and introduce to the students the topics that include combinational and sequential circuit analysis and design, digital circuit design optimization methods using random logic gates, multiplexers, decoders, registers, counters and programmable logic arrays.
Textbooks required for this Course:	• Digital Design, 5/E,M. Morris Mano, Michael D. Ciletti, ISBN-10:0132774208 • Digital Logic Design 4th Edition by Brian Holdsworth, Clive Woods MA DPhil 2002 • http://www.uoitc.edu.iq/images/documents/informatics-institute/Competitive_exam/Logic_Design.pdf • Introduction to Logic Circuits & Logic Design with VHDL 2nd edition 2019 DOI https://doi.org/10.1007/978-3-030-12489-2 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	By the end of the course the students should be able to: • Perform the conversion among different number systems; Familiar with baisc logic gates • Independently work in team to build simple logic circuits using basic. • Understand Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties. • Design simple combinational logics using baisc gates. • Able to optimize simple logic using Karnaugh maps, understand "don't care".

	• Familiar with basic sequential logic components: SR Latch, D Flip-Flop and their usage and able to analyze sequential logic circuits. • Understand finite state machines (FSM) concepte and work in team to do sequence circuit design based FSM and state table using D-FFs. • Familiar with basic combinational and sequential components used in the typical datapath designs: Register, Adders, Shifters, Comparators; Counters, Multiplier, Arithmetic-Logic Units (ALUs), RAM. • Do simple register-transfer level (RTL) design. • Understand and use one high-level hardware description languages (VHDL or Veriliog) to design combinational or sequential circuits. • Understand that the design process for today's billion-transistor digital systems becomes a more programming based process than before and programming skills are important.
Course Assessments	Midterm Exam 20% Activities 10% Attendance 10% 60 % Final exam. A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	. Introduction to number systems, decimal numbering system
Session 2 (Week 2)	Topics to be covered in the session (week) Binary numbering system, decimal to binary and binary to decimal conversion
Session 3 (Week 3)	Hexadecimal numbering system, hexadecimal to decimal and binary conversion.
Session 4 (Week 4)	Octal numbering system, octal to decimal, octal to binary and binary to octal conversions
Session 5 (Week 5)	Binary arithmetic
Session 6 (Week 6)	Two's complement Representation.
Session7(Week7-12)	Logic gates (AND, OR, The Inverter, NAND, NOR, XOR, XNOR) and their operation, truth table and timing analysis. Combinational logic circuits.
Session 8 (Week 13)	**Midterm Exam**
Session 9 (Week 14-17)	Boolean Algebra Laws and Rules Simplification of Combinational Logic Circuits. De-Morgan's Theorem. and-or-invert Gates for implementing Sum-of-Product Expressions.
Session 10(Week18-21)	Karnaugh Map (K-map). Arithmetic circuits (Half Adder and Full Adder circuits). sequential circuits (Latches) (S-R flip flop)
Session 11 (Week 22)	D Flip Flop, J-K Flip Flop. T Flip Flop, Master& Slave Flip Flop. Schmitt Trigger ICs.
Session 12 (Week 23)	**Shift Registers basics:** Serial to Serial, Serial to Parallel Registers. Parallel to Serial, Parallel to parallel Registers.

Session 13 (Week24-28)	Ring Shift Counter & Johnson Shift Counter. Counter Circuits, Ripple Counters (count UP and count DOWN counters). Multivibrators and 555 Timer
Session 14 (Week29)	Revision and discussion
Session15(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Programming Language C++

1	**Course name**	**Programming Language C++**
2	**Course Code**	DE209
3	**Course type: /general/specialty/optional**	**specialty**
4	**Accredited units**	3 Units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will provide students with a fundamental understanding of the nature of computer programming using C++. Emphasis on the fundamentals of object-oriented design with development, testing, implementation, and documentation. Includes language syntax, data and file structures, input/output devices, and files.	
Textbooks required for this Course:	• Starting Out with **C++** Early Objects 6th Edition Tony Gaddis Judy Walters Godfrey Muganda ISBN-13 : 978-0-321-51238-3 ISBN-10 : 0-321-51238-3 • The C++ Programming Language Fourth Edition by Bjarne Stroustrup 2013	

	http://chenweixiang.github.io/docs/The_C++_Programming_Language_4th_Edition_Bjarne_Stroustrup.pdf • A Complete Guide to Programming in C++ by Ulla Kirch-Prinz and Peter Prinz 2002 http://www.lmpt.univ-tours.fr/~volkov/C++.pdf • The C++ Programming Language, 4th Editionby Bjarne Stroustrup 4th edition Released July 2013 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, Laboratory experiments.
Course Objectives:	After competing this course, students should be able to: • Describe OOPs concepts • Use functions and pointers in your C++ program • Understand tokens, expressions, and control structures • Explain arrays and strings and create programs using them • Describe and use constructors and destructors • Understand and employ file management • Demonstrate how to control errors with exception handling • Understanding about object oriented programming. • Gain knowledge about the capability to store information together in an object. • Understand the capability of a class to rely upon another class. • Learn how to store one object inside another object • Learn use of one method can be used in variety of different ways • Understanding the process of exposing the essential data to the outside of the world and hiding the low level data • Create and process data in files using file I/O functions • Understand about constructors which are special type of functions • Learn how to write code in a way that it is independent of any particular type.
Course Assessments	Midterm Exam 20% Activities 10% Attendance 10% 60 % Final exam. A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction & variables - Course overview - About programming - Variables and data types - Keyboard input and screen output

Session 2 (Week 2)	Operators - Operator overview - Operator precedence - C++ operators vs. algebra operators
Session 3 (Week 3)	Control flow - Expressions - Branching code
Session 4 (Week 4)	Control flow (part 2) - Boolean expressions - Multipath branches – Loops
Session 5 (Week 5)	Functions - Writing C++ functions - Using C++ functions - Variable scope
Session 6 (Week 6)	Functions (part 2) - Retrieving data from functions - Call by reference
Session 7 (Week 7-12)	I/O streams - Streams - File I/O - Using classes
Session 8(Week 13)	**Midterm Exam**
Session 9 (Week 14-17)	Arrays - Introduction to arrays - Fixed-size arrays
Session 10 (Week 18-21)	Strings and vectors - C-style strings - C++ style strings – Vectors
Session 11 (Week 22)	Pointers - Using pointers - Memory management
Session 12 (Week 23)	Pointers and dynamic memory - Dynamic arrays - Pointer arithmetic
Session 13 (Week 24-28)	Classes and structures - Structures – Classes Using classes - Abstract data types – Inheritance Expanding classes - Friend functions - Operator overloading - Arrays in classes
Session 14 (Week 29)	Revision and discussion
Session 15 (Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب - المقررات الدراسية للسنة الثالثة قسم الأجهزة والمعدات الطبية

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.	
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications.	

	• http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem

	• Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling

	• Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Analogue Electronics

1	**Course name**	**Analogue Electronics**
2	**Course Code**	DE302
3	**Course type: /general/specialty/optional**	**specialty**
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of small signal modeling of transistors. Basic architecture and functionality of linear amplifiers including transistor biasing circuits, current sources, differential amplifier, common emitter amplifier, common source amplifier, emitter follower, source follower, common base amplifier, and common gale amplifier. Frequency response of single stage and multistage amplifiers
Textbooks required for this Course:	• Neamen, Donald. *Microelectronic Circuit Analysis and Design*. 3rd ed. New York, NY: McGraw-Hill, 2006. ISBN: 9780073285962. • The book comes with two free CD-roms and is the required textbook for this term Cathey, Jimmie J. *Schaum's Outlines Electronic Devices and Circuits*. 2nd ed. New York, NY: McGraw-Hill, 2002. ISBN: 9780071362702. • Analogue ElectronicsAnalysis and Design by Malcolm Goodge 1st edition 1990 DOI • https://doi.org/10.1007/978-1-349-20994-1 • Johnson, D. E., and V. Jayakumar. *Operational Amplifier Circuits*. Upper Saddle River, NJ: Prentice Hall, 1982. ISBN: 9780136374473. • Horowitz, Paul, and Winfield Hill. *The Art of Electronics*. 2nd ed. Cambridge, UK: Cambridge University Press, 1989. ISBN: 9780521370950. We strongly recommend that you also purchase this book. This reference will be useful in other courses and after graduation. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	By the end of the course sdudents should be sble to: • Learn different biasing techniques and behavior of BJT, FET at low and high frequencies.

	• Understand the principle of operation of different amplifier circuits like feedback amplifiers, power amplifiers. • Understand the principle of operation of different oscillators circuits. • Recognize/identify and analyze idealized passive linear circuits • Apply KCL, KVL, write down node equations for a given circuit correctly using phasor notation • Understand the principle of operation of different oscillators circuits. • Apply superposition, whenever necessary and solve circuit equations correctly • Numerically determine circuit variables, voltage and/or current amplitude, frequency, phase accurately up to the required precision, in specified notation (scientific or engineering); • Design idealized passive linear circuits under sinusoidal excitation: • Determine the type and/or value of an element of a circuit for a specified circuit performance (like transfer function, cut off frequency, etc.) • understand that an ideal model for a component is very useful to eal components, and any experience with real components can be predicted through a model based analysis: • Draw the circuit diagram for any combination of elements correctly; • Apply the systematic analysis methods and read circuit diagrams of intermediate complexity
Course Assessments	Midterm exam 20 % Activities10% Atendances 10% Final Exam 60 % final A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Semiconductor Materials
Session 2 (Week 2)	n-type and p-type Materials.
Session 3 (Week 3)	Semiconductor Diode – Diode biases.
Session 4 (Week 4)	Diode applications: Load Line, Series, Parallel and series- Parallel Diode configurations.
Session 5 (Week 5)	Diode as a rectifier: Half wave rectifier and Full wave rectifier.
Session 6 (Week 6)	Diode types.
Session 7 (Week 7-12)	Bipolar junction transistors (BJT): Transistor Construction- Transistor operation Transistors configurations: CB-CE-CC Dc Biasing- BJTs: Operating Point and the biases configurations Fixed, Emitter, Voltage Divider and Collector Feedback biases Configurations). Current Mirror Circuits and Current Source Circuits.
Session 8 (Week 13)	**Midterm Exam**
Session 9 (Week 14-17)	Field – Effect Transistors(FET) : Construction and Characteristics of FETs.

	FET Biasing (Fixed-Bias configuration, Self-Bias configuration, Voltage-Divider Biasing, Common Gate configuration) .
Session 10 (Week 18-21)	Diode biases. Diode applications. Series, Parallel and series- Parallel Diode configurations.
Session 11 (Week 22)	Diode as a rectifier: Half wave rectifier and Full wave rectifier. Understand the Diode types and their applications.
Session12 (Week 23)	Transistor Construction. Transistors configurations: CB-CE-CC.
Session 13 (Week 24-28)	Transistor biases configurations (Fixed, Emitter, Voltage Divider and Collector Feedback biases Configurations) Field – Effect Transistors(JFET) biasing
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Electrical measurements

1	**Course name**	**Electrical measurements**
2	**Course Code**	DE303
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2021- 2020
Brief Description:	This course will provide students with a fundamental understanding and gives an overview of fundamentals of electronic measurement systems and elements of electronic instrumentation. Contents: Digital multimeter and oscilloscope. Eelectronic measurements,	

	electronic measurement channel, static and dynamic characteristics, electromagnetic interferences, signal sources and acquisition. Sensors. Amplifiers. Noise. Voltage references. Analog-to-digital conversion. Measurement data communication. Examples and exercises.
Textbooks required for this Course:	• E.W.Golding & F.C.Widdis, 'Electrical Measurements & Measuring Instruments', A.H.Wheeler & Co, 1994. 2. A.K. Sawhney, 'Electrical & Electronic • Measurements and Instrumentation', Dhanpath Rai & Co (P) Ltd, 2004. • Electrical Measurements in the Laboratory Practice by Rosario Bartiromo, Mario De Vincenzi 1st edition 2016 https://doi.org/10.1007/978-3-319-31102-9 • Principles of Electrical Measurement By Slawomir Tumanski 1st edition 2006 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon Completing the Course, Student should able to: • To use the techniques and skills for electrical projects. • Design a system, component or process to meet desired needs in electrical engineering. • Measurement of R,L,C ,Voltage, Current, Power factor , Power, Energy. • Ability to balance Bridges to find unknown values. • Ability to measure frequency, phase with Oscilloscope. • Ability to use Digital voltmeters • Gain a clear knowledge of the basic laws governing theoperation of electrical instruments and the measurement techniques • Emphasis is laid on the meters used to measure current & voltage. • Have an adequate knowledge in the measurement techniques for power and energy, power and energy meters are included. • Elaborate discussion about potentiometer & instrument transformers. • Detailed study of resistance measuring methods. • Detailed study of inductance and capacitance measurement.
Course Assessments	Midterm exam 20 % Activities10% Atendances 10% Final Exam 60 % final A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Inverting and Non-inverting amplifier. AC signal sources, signal generator, Oscillators. Classification of Oscillators. Requirements of oscillation.
Session 2 (Week 2)	• Audio Frequency Oscillator, Wien bridge Oscillators, Phase shift Oscillators, Frequency, Gain, Feedback Factor and their Applications

Session 3 (Week 3)	• Radio Frequency Oscillators :Colpitts Oscillators, Hartley Oscillators, Crystal Oscillators Frequency, Gain, Feedback Factor and their Applications
Session 4 (Week 4)	Function Generators, Characteristics of each part and its analysis
Session 5 (Week 5)	Attenuators circuit, L-type Attenuators, T-type Attenuators, Pi-type Attenuators
Session 6 (Week 6)	Signal Analysis: Harmonic Distortion, Frequency Spectrum of Harmonic distortion, Harmonic Distortion Analyzer.
Session 7 (Week 7-12)	Transducers, Classification of Transducers, Active and Passive Transducers. Digital and Analog Transducers. Primary and Secondary Transducers. Selection of Transducers.
Session 8 (Week 13)	**Midterm Exam**
Session9(Week 14-17)	Displacement Transducer, Resistive position Transducers and Strain Gauge Transducers.
Session10(Week 18-21)	Capacitive Transducers, rotary plate capacitor, Recti-linear Capacitor, Diaphragm. Inductive Transducers: Tachometers, Linear Variable Differential Transducer (LVDT)
Session 11(Week 22)	Temperature and displacement sensors" Temperature measurement devices and their parameters, Thermistor and Thermometer
Session 12 (Week 23)	Photovoltaic theory of operation" Light intensity and definitions , Dark IV diode characteristics ,Light absorption by semiconductors, Photomultiplier and photoconductive
Session13(Week 24-28)	Data acquisition system: signal conditioning circuit: buffering, filtering, signal level change, signal conversion, linearization and multiplexers. Analog to digital and digital to analog converter "Analog to digital conversion concept, Digital to analog conversion concept, Multiplexing, Interference problem solvers Computer controlled test" Introduction to computer control testing, Case study, Digital control and signal timing concept
Session 14 (Week 29)	Revision and discussion
Session15(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Engineering Drawing

1	Course name	**Engineering Drawing**
2	Course Code	DE304
3	Course type: /general/specialty/optional	Specialty
4	Accredited units	3
5	Educational hours	4 hours per week
6	Pre-requisite requirements	Non
7	Program offered the course	Medical Devices and Equipment Prog.
8	Instruction Language	English
9	Date of course approval	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of drawing material, concept of sizes, dimensions and imagination and introduces technical drawing a means of professional engineering communication. It will cover: sketching, line drawing, shape description, projections, drawing standards, sections and dimensioning
Textbooks required for this Course:	• https://ia800107.us.archive.org/18/items/TextbookOfEngineeringDrawing_201802/Textbook%20of%20Engineering%20Drawing.pdf • A Textbook of Engineering Drawing: for Undergraduate Engineering Students Paperback – June 23, 2020 by Addisu Dagne Zegeye • Geometric and Engineering DrawingBy Ken Morling, Stéphane Danjou 4 edition 2020 • A Textbook of Engineering Drawing First Edition by Roop LalRamakant Rana 2020 Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Use drawing instruments and to draw polygons, Engg. Curves. • Draw the projections of the lines inclined to both the planes. • Draw the projections of the various types of solids in different positions inclined to one of the planes • Provide students with knowledge and abilities to design a 3D object on 2D paper including all manufacturing constraints by hand sketching method and by means of compueter aided design software.

	• Emphasize the importance of drawing as a language for engineers • Develop skills in engineering drawing and drafting. • Develop skills in interpretation of engineering drawings • Develop skills in computer aided drafting and design
Course Assessments	20 % Midterm Exam 10% attendances 10% activities Final Exam 60 %. A60..% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Drawing Instruments, Metric and SI units, Title Block, Line, Lettering and Dimensioning, Scaling, Freehand sketching
Session 2 (Week 2- 3)	Dimensioning, Abbreviations and symbols, Interpreting engineering drawing
Session 3 (Week 4)	Applied geometry
Session 4 (Week 5)	Theory of orthographic projection and orthographic drawing
Session 5(Week 6)	Orthographic drawing
Session 6(Week 7)	Pictorial drawing (Isometric drawing)
Session 7 (Week 8)	Auxiliary views drawing
Session 8 (Week 9-10)	Sectional views drawing (Full section, Half section)
Session9 (Week 11)	Review
Session 10 (Week 12)	3D modeling
Session 11 (Week 13-14)	Project drawings
Session 12 (Week 15)	**Midterm Exam**
Session 13(Week 16 -18)	Sectional views drawing (Broken section and Offset section)
Session 14 (Week 18-20)	Sectional views drawing (Revolve section, Removed section)
Session 15Week 21-22)	Computer-aided design (2D drawing)
Session 16 (Week 23-24)	Computer-aided design (simple assembly drawings)
Session 17 (Week 25-27)	Engineering drawing for environmental engineering and disaster management
Session 18 (Week 28-29)	Revision and discussion
Session 30 (Week 30)	**Final Exam 60%**
Attendance	Students are expected to attend every session of class, arriving on time,
Expectations	returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.

Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Digital Signal Processing

1	**Course name**	**Digital Signal Processing**
2	**Course Code**	DE305
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of basic concepts of discrete-time signals and proceed to learn how to analyze data via the Fourier transform, how to manipulate data via digital filters and how to convert analog signals into digital and to the solid theoretical bases are complemented by applied examples in Matlab. As will as to design and lab exercises are also significant components of the course.
Textbooks required for this Course:	• John G. Proakis, Dimitris G. Manolakis (2007), Digital Signal Processing, Principles, Algorithms, and Applications,Pearson Education / PHI, India. • A.V. Oppenheim, R. W. Schaffer (2009), Discrete Time Signal Processing, Prentice Hall of India, New Delhi. • https://users.dimi.uniud.it/~antonio.dangelo/MMS/materials/Guide_to_Digital_Signal_Process.pdf • https://wwwelec.inaoep.mx/~jmram/Digital_Signal_Processing_LI_TAN.pdf • Digital Signal Processing using Arm Cortex-M based Microcontrollers: Theory and Practice by By Cem Ünsalan, M. Erkin Yücel, H. Deniz Gürhan ISBN 978-191153116-6 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor

Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	By the end of the course the students should be able to: • Understand basic techniques in designing and implementing digital signal processing systems. • Learn basic methods of spectral analisis. • Explore the data communication systems. • Teach students to design digital filters. • Know fundamental material for the analysis and processing of digital signals. • Familiarize the relationships between continuous-time and discrete-time signals and systems. • 3. Study fundamentals of time, frequency and z-plane analysis and to discuss the interrelationships of these analytic method. • 4. Study the designs and structures of digital (IIR and FIR) filters from analysis to synthesis for a given specification. • 5. Introduce a few real-world signal processing applications
Course Assessments	20 % Midterm Exam 10% attendances 10% activities Final Exam 60 %. A60..% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Basics of Digital Signal Processing Sampling and Quantization, Kotelnikov / Nyquist–Shannon sampling theorem. Amplitude, phase, frequency. Periodic signals, aliasing.
Session 2 (Week 2)	Introduction to The Fourier Transform Properties of the Fourier Transform. Digital Fourier transform,
Session 3 (Week 3)	Fast Fourier Transform algorithms FIT, DIT. Window functions
Session 4 (Week 4)	Wavelet transform Wavelet digital transform, Wavelet continuous transform. Orthogonal basis. Types of wavelets.
Session5-9 (Week5-9)	Discrete Time Systems Filter classification in the frequency domain, FIR and IIR filters. Transfer function, Impulse Response, Convolution. Design of filters by windowing
Session10-14(Week 10-14)	The Z-transform Properties of the z transform. Poles, Zeros. Pole-zero diagram and frequency response.
Session 15 (Week 15)	**Midterm Exam**
Session16-21(Week16-21)	Digital Communication Systems PWM, Keying, Symbol rate, Constellation and Scatter plots. QAM. Filter shaping. Sigma-Delta modulation
Session 22 (Week 22-28)	Modulation and demodulation Amplitude and Angle Modulation. Quadrature modulation. Deviation. Spectral characteristics.
Session 23 (Week 29)	Revision and discussion
Session24 (Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long

	learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Sensors and Transducers

1	**Course name**	**Sensors and Transducers**
2	**Course Code**	**DE306**
3	**Course type: /general/specialty/optional**	**specialty**
4	**Accredited units**	3 units
5	**Educational hours**	4 hours
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the course and provides the theory and application of sensors typically found in an automated manufacturing system. Topics include physical properties, operating range, and other characteristics of numerous sensors and transducers used to detect temperature, pressure, position, and other desired physical parameters.
Textbooks required for this Course:	• Textbook or Manual: Handouts posted on the Web 1. Handbook of Modern Sensors, 2nd Ed. By Jacob Fraden (Optional), 2. Semiconductor Sensors, Edited by S. M. Sze (Optional) • Sensors and Transducers by Ian R. Sinclair Third Edition 2001 • Handbook of Sensors and Transducers Gavin Lawrence 2019 • SENSORS AND TRANSDUCERS bylan Sinclair 3th edition 2001 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments
Course Objectives:	Upon completion, students should be able to:

	• Interface a sensor to a PLC, PC, or process control system • Select the right sensor for a given application. • Design basic circuit building blocks. • Simulate, synthesize, and layout a complete sensor or sensor system, MEMS device or microsystem ready for fabrication tools • Familiar with the constructions and working principle of different types of sensors and transducers. • aware about the measuring instruments and the methods of measurement and the use of different transducers • Use concepts in common methods for converting a physical parameter into an electrical quantity • Classify and explain with examples of transducers, including those for measurement of temperature, strain, motion, position and light • Choose proper sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc • Predict correctly the expected performance of various sensors • Locate different type of sensors used in real life applications and paraphrase their importance • Set up testing strategies to evaluate performance characteristics of different types of sensors and transducers and develop professional skills in acquiring and applying the knowledge outside the classroom through design of a real-life instrumentation system.
Course Assessments	20 % Midterm Exam 10% attendances 10% activities Final Exam 60 %. A60..% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Example of Smart Sensors in nature (Vision, Hearing, touch, and smell). How we can learn from nature
Session 2 (Week 2)	Principles of Sensing, Classification and Terminology of Sensors,
Session 3 (Week 3)	Measurands. Some basic discussion about electric field, potential, capacitance, resistance etc
Session 4 (Week 4)	• Mechanical Sensors, Acoustic, and Magnetic Sensors
Session 5 (Week 5)	Radiation and Thermal Sensors
Session 6 (Week 6)	• Chemical and Biosensors
Session 7 (Week 7)	• Electronic Interface and Integrated Sensors/Design Projects/ Wireless integration
Session 8 (Week 8)	(Lec) Electronics interfacing overview and technology design rules
Session 9-10 (Week 9-10)	Introduction to Microsystems
Session 11 (Week 11-12)	MEMS microsystem components
Session 12 (Week 13)	**Midterm Exam**
Session 13 (Week 14-15)	Microfluidics microsystem components

Session 14 (Week 15-16)	Microfluidics continued microsystem components
Session15-20(Week15-20)	Electronic/wireless integration Putting it all together- system design
Session 21-27 (Week 21-27)	Putting it all together part II Design Report/ presentation Due
Session 27 (Week 28)	Revision and discussion
Session 28 (Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Microprocessor and Interface

1	**Course name**	**Microprocessor and Interface**
2	**Course Code**	DE307
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 Units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of Microprocessor and Interface required for under-graduate students in the ECE program. The purpose of this course is to teach students the fundamentals of microprocessor and microcontroller systems. The student will be able to incorporate these concepts into their electronic designs for other courses where control can be achieved via a microprocessor/controller implementation.
Textbooks required for this Course:	• Ramesh Gaonkar, 'Microprocessor Architecture, Programming & application with 8085', by Ramesh S. Gaonkar5th Edition, 2002. • B. Ram, 'Fundamentals of Microprocessors and Microcomputers', Dhanpat Rai Publications. • Microprocessors and Interfacing by N. Senthil Kumar, M. Saravanan,, S. Jeevananthan & S.K. Shah 1st edition 2012 • Microcomputers and Microprocessors: The 8080, 8085, and Z-80 Programming, Interfacing, and Troubleshooting (3rd Edition) 3rd Edition by John E. Uffenbeck 1999 • https://easyengineering.net/microprocessors-and-interfacing-by-godse/ • https://libraryfile.university/files/4667271-microprocessor-and-interfacing-douglas-hall-2nd-edition • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	At the end of the course, students should develop ability to • Define the history of microprocessors • Study of the basics of control, units of measurement, and Laplace transforms. • Describe the architectures of 8085 and 8086 microprocessors.

	• Draw timing diagram • Write programs using 8086 and 8051 • Distinguish between the different modules of operation of microprocessors. • Interface peripherals to 8086 and 8051 • Evaluate the appropriateness of a memory expansion interface based on the address reference with particular application. • Study of open circuit linear systems and closed circuit systems and the schematic drawings of the stages. • Understand dynamic behavior analysis of physical processes (Linear Systems Transient Response Analysis) • StuAnalyse and design of feed back control systems • Understand frequency response analysis of linear systems • Learn the design aspects of I/O and Memory Interfacing circuits. • Study about communication and bus interfacing. • Get exposed to RSIC processors and design ARM microcontroller based systems • Develop programs and compare microprocessors and microcontrollers
Course Assessments	20 % Midterm Exam 10% attendances 10% Activities Final Exam 60 %. A60..% is required for a pass in this course..
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Microprocessor
Session 2 (Week 2)	Components of a Microprocessor Registers, ALU and control & timing, System bus (data, address and control bus), Microprocessor systems with bus organization
Session 3 (Week 3 -4)	Microprocessor Architecture and Operations, Memory, I/O devices, Memory and I/O operations
Session 4 (Week 5-6)	8085 Microprocessor Architecture, Address, Data And Control Buses,
Session 5(Week 7-8)	8085, Pin Functions, Demultiplexing of Buses, Generation Of Control Signals, Instruction Cycle, Machine Cycles, T-States, Memory Interfacing
Session 6(Week 9-10)	Assembly Language Programming Basics Classification of Instructions, Addressing Modes
Session 7 (Week 11 -12)	8085 Instruction Set, Instruction And Data Formats
Session 8 (Week 13-14)	Writing, Assembling & Executing A Program, Debugging The Programs
Session 9 (Week 15-17)	Writing 8085 assembly language programs with decision, making and looping using data transfer, arithmetic, logical and branch instructions
Session 10 (Week 18)	**Midterm Exam**
Session 11 (Week 19-22)	Stack & Subroutines, Developing Counters and Time Delay Routines, Code Conversion, BCD Arithmetic and 16-Bit Data operations,
Session 12 (Week 23)	Interfacing Concepts, Ports, Interfacing Of I/O Devices, Interrupts In 8085
Session 13 (Week 24)	Programmable Interrupt Controller 8259A

Session 14 (Week 25)	Programmable Peripheral Interface 8255A
Session 15 (Week 26)	Advanced Microprocessors : 8086 logical block diagram, segmentation, Pin functions, Minimum and maximum mode, 80286/80386:
Session 16 (Week 27)	Overview and architecture, Programming model, Data types and instruction set,
Session 17 (Week 28)	Segments and its types, segment descriptor, descriptor table and selectors
Session 18 (Week 29)	Revision and discussion
Session 19(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Control Systems

1	**Course name**	**Control Systems**
2	**Course Code**	DE308
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Introductory course in control theory: system modeling, simulation, analysis and controller design. Description of linear, time-invariant, continuous time systems, differential equations, transfer function representation, block diagrams and signal flows. System dynamic properties in time and frequency

	domains, performance specifications. Basic properties of feedback.
Textbooks required for this Course:	• Introduction to Control Systems, an (2nd Edition) (Advanced Electrical and Computer Engineering) 2nd Edition by Kevin Warwick 1996. • Control Systems Engineering by Norman S. Nise 7th edition 2015 • Control Systems an Introduction by Dr. D. Sundararajan 1st edition 2022 https://doi.org/10.1007/978-3-030-98445-8 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon successful completion, students will have the knowledge and skills to: • Define and explain feedback and feed-forward control architecture and discuss the importance of performance, robustness and stability in control design • Interpret and apply block diagram representations of control systems and design PID controllers based on empirical tuning rules • Compute stability of linear systems using the Routh array test and use this to generate control design constraints • Use Evans root locus techniques in control design for real world systems • Compute gain and phase margins from Bode diagrams and Nyquist plots and understand their implications in terms of robust stability • Design Lead-Lag compensators based on frequency data for an open-loop linear system
Course Assessments	Midterm exam 20 % 10% attendances 10% activities Final Exam 60%. A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to control system Motivation, examples of control systems, feedback control systems
Session 2 (Week 2)	Motivation, examples of control systems, feedback control systems
Session 3 (Week 3)	Instrumentation
Session 4 (Week 4)	Mathematical modelling: Mathematical modelling of: electrical systems, mechanical systems, electro-mechanical systems.
Session 5 (Week 5)	Mathematical modelling: Laplace transforms, transfer functions, electrical analogues of other dynamical systems
Session 6 (Week 6)	State-space modelling of dynamical systems.

Session 7(Week 7)	Block: diagrams, block diagram reductions. Signal flow graph, Mason's gain formula. Linearity, time-invariance versus nonlinearity and time-variance. Linearization
Session8(Week 8)	Distributed parameter systems.
Session 9 (Week 9)	Modeling and Analysis of Control Processes
Session 10 (Week 10)	Linear Open Circuit Systems
Session 11 (Week 11)	Closed Circuit Systems, Phase Diagrams
Session 12 (Week 12)	Analysis of the dynamic behavior of chemical processes
Session 13 (Week 13)	(Transient response analysis of linear systems)
Session 14 (Week 14)	Analysis and design of feed back control systems
Session 15 (Week 15 -16)	Time response of dynamical systems: Obtaining solutions from mathematical models.
Session 16 (Week 17)	Poles and zeros and their effects on solutions. Step response of standard second order systems, time-domain specifications and their formulae.
Session 17 (Week 18)	**Midterm Exam**
Session 18 (Week 19)	Properties of feedback: Basic idea of feedback control systems.
Session 19 (Week 20)	Error analysis. P, PI, PD, PID controllers.
Session 20 (Week 21)	Stability: Definition of stability. Routh-Hurwitz test. Lyapunov theory
Session 21 (Week 22 -23)	Stability of feedback control systems
Session 22 (Week 24)	Design of controllers: The root-locus technique, steps in obtaining a root-locus.
Session 23 (Week 25)	Design of controllers using root-locus. Pole placement with state feedback, controllability. Pole placement with output feedback, observability, Luenberger observer. LQR control.
Session 24(Week 26)	Frequency domain analysis: Bode plot, Nyquist plot, Nyquist stability criterion, gain and phase margins, robustness.
Session 25 (Week 27)	Frequency response analysis of linear systems
Session 26(Week 28	Introduction to Nonlinear Systems.
Session 27 (Week 29)	Design of compensators: Lead compensator, lag compensator, lead-lag/lag-lead compensators, their design.
Session 28 (Week 30)	Revision and discussion
Session 39 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Electrical circuits

1	**Course name**	**Electrical circuits**
2	**Course Code**	DE309
3	**Course type:**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the fundamental concepts in electrical circuits; circuit analysis and network theorems; linearity and superposition; series/parallel combinations of R, L, and C circuits; sinusoidal forcing; complex frequency and Bode plots; mutual inductance and transformers; two port networks
Textbooks required for this Course:	• J. W. Nilsson and S. Riedel, Electric Circuits, 11th Edition, 2018, Pearson, ISBN13: 978-0134746968. • Hayt, Kemmerly, Phillips, and Durbin, *Engineering Circuit Analysis*, McGraw Hill, 9th edition (2019) • Electric Circuits A Concise, Conceptual Tutorial by Gengsheng Lawrence Zeng, Megan Zeng 1st edition 2021 https://doi.org/10.1007/978-3-030-60515-5 • Electric Circuits (10th Edition) 10th Editionby James W. Nilsson , Susan Riedel 2019 • Introduction to Electrical Circuit Analysis by Ozgur Ergul 2017 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, Laboratory experiments.
Course Objectives:	Upon completion of the course the student should be able to: • Understand the principle of electric circuit design and application. • Understand the principles of DC and AC . • Understand the techniques to analyze different circuit configuration • Develop an understanding of the fundamental laws and elements of electrical circuits. • Learn the energy properties of electric elements and the techniques to measure voltage and current. • Develop the ability to apply circuit analysis to DC and AC circuits. • Understand transient and steady-state response of RLC circuits and to understand advanced mathematical

	methods such as Laplace transforms for solving circuit problems. • Apply the knowledge of basic circuital laws and simplify the dc and ac networks using reduction techniques. • Analyze the dc and ac circuits using mesh and nodal analysis and network simplification theorems. Analyze the series and parallel resonant circuits. • Infer and evaluate transient response, steady state response of series, parallel and compound circuits. • Develop Laplace transformed network for steady state and transient analysis. • Analyze dc and ac circuits and time domain response using P-Spice.
Course Assessments	Midterm exam 20 % 10% attendances 10% activities Final Exam 60%. A 60 % is required for a pass in this course..
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	. Fundamental electric circuit quantities
Session 2 (Week 2)	The "alphabet" of circuit schematics
Session 3 (Week 3)	. Kirchhoff's current and voltage laws
Session 4 (Week 4)	Ohm's law
Session 5 (Week 5)	Series and parallel resistor combinations
Session 6 (Week 6)	Voltage and current division
Session 7-12 (Week 7-12)	The venin and Norton equivalents
Session 13 (Week 13)	**Midterm Exam**
Session 14-17 (Week 14-17)	Linearity and superposition
Session 18-21 (Week 18-21)	Linear algebraic techniques (Node & Mesh)
Session 22 (Week 22)	Op amp circuits Capacitors and inductors
Session 23 (Week 23)	First and second order circuits in time domain)
Session 24-28 (Week 24-28)	Issues in Contemporary Electronics
Session 29 (Week 29)	Revision and discussion
Session 30 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج. المقررات الدراسية للسنة الرابعة قسم الأجهزة والمعدات الطبية

Electromagnetic Fields

1	**Course name**	**Electromagnetic Fields**
2	**Course Code**	DE401
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 Units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of Rigorous development of fundamental electrostatic, magnetostatic, and electromagnetic behavior, with special attention toward practical applications.
Textbooks required for this Course:	• Hayt, W.H., Engineering Electromagnetics, Tata McGraw Hill (2008) 7th ed. • Engineering electromagnetics by William H. Hayt, John A. Buck 7th edition 2006 • Kraus, J.D., Electromagnetics, McGraw Hill (2006) 5thed. Sadiku, M.N.O, Elements of Electromagnetics, Oxford University Press (2009) 4th ed. • Jordan, E.C. and Balmain K.G., Electromagnetic Waves and Radiating Systems, Prentice Hall of India (2008) 2nd ed. • https://www.sicyon.com/resources/library/physics/EMFT_Book.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of the course the students should be able to: • Describe the fundamentals of Electrostatics and magnetostatic • Identify the characteristics of materials and relate them to electric and magnetic fields • Demonstrate the theoretical background of Maxwell's equations and electromagnetic wave concepts, regarding propagation characteristics, polarization, reflection • Analyze fields a potential due to static changes • Evaluate static magnetic fields • Understand how materials affect electric and magnetic fields

	• Understand the relation between the fields under time varying situations • Understand principles of propagation of uniform plane waves.
Course Assessments	Midterm exam 20 % 10% Activities 10% participation. Final Exam 60 % final. A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to electromagnetic Fields
Session 2 (Week 2)	A brief overview of vector calculus. Static electric fields, Fundamental postulates of electrostatics, Coulomb's law
Session 3 (Week 3)	Electric field due to a continuous distribution of charges, Electric flux density, Gauss' law Assignment 2 handed out
Session 4 (Week 4)	Electrostatic potential
Session 5 (Week 5)	The behavior of material media (conductors and dielectrics) in a static electric field,
Session 6 (Week 6)	Capacitance and electrostatic energy
Session 7 (Week 7)	• Poisson's and Laplace equations, Method of images
Session 8 (Week 8)	• Steady electric currents, Continuity of current, Resistance
Session 9 (Week9 -10)	Boundary conditions Static magnetic fields, Fundamental postulates of magnetostatics
Session11(Week 11)	Biot-Savart law, Ampere's law
Session12(Week12)	Magnetization, Magnetic flux density
Session13(Week13 -14)	Boundary conditions Homework#3 11 Self and mutual inductance, Magnetic energy, and forces
Session 14 (Week 15)	**Midterm Exam**
Session 15 (Week 16)	Maxwell's equations to determine field waves, potential waves, energy
Session16 (Week17)	Introduction of Time-varying fields and Maxwell's equations Review of some topics
Session17 (Week18)	Plane-Wave Propagation
Session18 (Week19)	Introduction to Waves and Phasors
Session19 (Week20)	Transmission Lines
Session20 (Week21)	Electrostatics and Magnetostatics
Session21 (Week 22)	Vector Analysis Repetition of vector analysis. Repetition of the electrostatic and magnetostatic fields, including the polarisation field in dielectrics and the magnetisation field in magnetisable media.
Session22 (Week23- 24)	Potential theory (boundary value problems, uniqueness theorem, method of images, separation of variables). with applications in electrostatics, magnetostatics and stationary current distributions
Session23 (Week 25 -26)	Induction law and displacement current. Maxwells equations. Poyntings theorem. Wave equation, plane waves and a brief description of waves along different types of wave guides.
Session24 (Week 27 -28)	Field penetration in conducting media. Skin depth. Generation of electromagnetic radiation (inhomogeneous wave equation, retarded potentials). Electric dipole radiation field.
Session25 (Week 29)	Revision and discussion

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Session 26 (Week 30-32)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Instrumentation

1	**Course name**	**Medical Instrumentation**
2	**Course Code**	DE402
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description	This course is designed for biomedical engineering undergraduate students. The purpose of the course is to provide biomedical instrumentation background on technical aspects. Biomedical measurement systems are introduced in detail. Students are provided with overviews of the major physical techniques that engineers have used to explore in biomedical engineering levels	
Textbooks required for this Course:	• R S Khandpur, "Handbook of Biomedical Instrumentation", 1st ed., Tata McGraw Hill Publishing Company Limited, 2004. • 1. John G. Webster, "Medical Instrumentation Application and Design", John Wiley and sons, New York, 2004 2.Joseph J. Carr and John M. Brown, "Introduction to Biomedical Equipment Technology", Pearson Education, 2004. 3. Leslie Cromwell,	

	"Biomedical Instrumentation and measurement", Prentice hall of India, New Delhi, 2007 • 20. J.J. Carr, J.M. Brown: Introduction to Biomedical Equipment Technology, Prentice Hall, 2nd Ed. 2001. 21 J.G Webster: Medical Instrumentation: Application and design, Wiley, 2010. • https://www.oss.unist.hr/sites/default/files/dokumenti/courses/electronics/SEL039_Medical_instrumentation.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the basics of biomedical amplifiers and measurements. • Know the principles of medical instrumentations • Get a considerable understanding on clinical applications of medical instrumentation systems. • Maintain medical instrumentation. • Define basic medical terms and physical values that can be handled by medical instrumentation, • Describe methods and implementation of electrical and nonelectrical medical parameters diagnostic, • Demonstrate measuring of basic medical parameters, • Calculate basic parameters of the equipment for using in electro diagnostic and electro therapy, • Recommend problem solving and service procedures for electrical equipment, • Apply safety standards and select disposal method and procedures for electrical diagnostic equipmen
Course Assessments	20 % Midterm Exam 10% Attendances 10% Activities Final Exam: 60% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1-2 (Week 1-2)	An introduction: Biological Science Chemical Science Computer Science Foundation Course Mathematical Science
Session 3(Week 3)	• Physical Science • Biological Science & Chemical Science Practical • Computer Science & Instrumentation Practical • Physical Science & Mathematical Practical

Session 4-5 (Week 4-5)	Basic concepts of biomedical instrumentation Biomedical signal analysis
Session 6(Week6)	Bio potentials: ECG, EEG, ENG, EMG, ERG
Session 7 (Week 7-8)	Blood pressure, sound and Biomedical sensors
Session 8 (Week 9-10)	Medical instruments and devices 2
Session 9(Week11)	Principles of Diagnostic & Therapeutic Equipment's
Session 10(Week12)	Medical Imaging system
Session 11(Week13)	Biomechanics, Therapeutic and prosthetic devices
Session 12 (Week 14)	**Midterm Exam**
Session 13 (Week 15)	Basic of Electronics and Overview of Biomedical Industries
Session 14 (Week 16-17)	Basic of Electronics and Overview of Biomedical Industries. Basic Electronics and Connection Electromagnetism
Session 15 (Week 18-19)	Human anatomy and physiology Introduction to Human Body Cell Structure and Function Skeletal System and Muscular System Nervous System Endocrine System and Lymphatic System Respiratory System and Digestive System Reproductive System
Session 16 (Week 20)	Concepts, Principles and Fundamentals of Medical Instrumentation
Session 17 (Week 21-22)	• Electrodes- Bio-electric Signals and Bio Electrodes. • Electrode Tissue Interface • Contact Impedance and Types of Electrodes • Uses of Electrodes (ECG, EEG, EOG and EMG). • Transducers (Typical signals from physiological parameters, Pressure Transducer, Temperature Transducer). • Sensors (Pulse Sensor, Respiration Sensor, Recording System). • Based Instrumentations: Type of medical equipment (Diagnostic and Therapeutic).
Session 18 (Week 21-22)	Bio Medical Equipment's Repair and Maintenance Bio Medical Equipment: 1. ECG Machine (Basics & Block Diagram, Circuit Diagram, Repair and Maintenance). 2. EEG Machine (Basics & Block Diagram, Circuit Diagram , Repair and Maintenance). 3. EMG Machine : (Basics & Block Diagram, Circuit Diagram, Repair and Maintenance). 4. X-Ray: (Basics & Block Diagram, Circuit Diagram ,Repair and Maintenance).

	5. Ultrasound : (Block Diagram and cards, Repair and Maintenance)
Session 19 (Week 22-25)	Patient Monitoring System: (Heart Rate Measurement , Pulse Rate Measurement, Respiration Rate Measurement, Blood Pressure Measurement, Principle of defibrillator and pace maker).
	Measurement and Calibrating of Instruments Digital Multimeter (Analog Multimeter, Digital Storage Oscilloscope, Function Generator, Simulators). Test and Calibrating Instruments (Use of Test and Calibrating Equipment, Confirming Specifications). Measurement of Output Quantity, Testing Repeatability of Results.
Session 20 (Week 26-28)	Study of Internal Parts in Open Condition X-Ray (30 mA, 50 mA) 1. Pulse Oximeter 2. ECG 3. EEG 4. EMG 5. Multi Para Monito 6. Defibrillator 7. Blood Pressure Meter 8. Physiotherapy Equipment 9. Surgical Diathermy 10. Colorimeter and Ultrasound Doppler 11. Ventilatorand OT Lamp 12. Pace Maker and Oxygen Concentrator 13. Infusion Pump
Session 21 (Week 29)	Revision and discussion
Session22(Week 30-32)	**Final Exam**
Attendance	Students are expected to attend every session of class, arriving on time,
Expectations	returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Digital image Processing

1	**Course name**	**Digital image Processing**
2	**Course Code**	**DE403**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of digital image processing techniques including representation, sampling and quantization, image acquisition, imaging geometry, image transforms, image enhancement, image smoothing and sharpening, and image restoration.
Textbooks required for this Course:	• Rafael C. Gonzalez, Richard E. Woods, _Digital Image Processing', Pearson, Third Edition, 2010. • Anil K. Jain, _Fundamentals of Digital Image Processing', Pearson, 2002. • Kenneth R. Castleman, Digital Image Processing', Pearson, 2006. • Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, _Digital Image Processing using MATLAB', Pearson Education, Inc., 2011. • D,E. Dudgeon and RM. Mersereau, _Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference, 1990. • William K. Pratt, _Digital Image Processing', John Wiley, New York, 2002 • Milan Sonka et al _Image processing, analysis and machine vision', Brookes/Cole, Vikas Publishing House, 2nd edition, 1999. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments
Course Objectives:	At the end of the course the students should be able to: • Become familiar with digital image fundamentals • Learn concepts of degradation function and restoration techniques. • Understand the image segmentation and representation techniques. • Learn and identify ways to compress images

	• Gain the image fundamentals and mathematical transforms necessary for image processing. • Know the image enhancement techniques • Understand image restoration and compression procedures.
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam practical. A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Introduction** Motivation Why is Computer Vision Difficult? Image Representation and Image Analysis Tasks
Session 2 (Week 2)	Introduction to the MATLAB Image Processing Toolbox MATLAB - general concepts Image processing using the MATLAB Image Processing Toolbox
Session 3 (Week 3 - 4)	The Image, its Representations and Properties • Image representations and Image digitalization • Sampling and Quantization • Digital image Properties
Session 4 (Week 5 - 6)	• Metric and Topological Properties of Digital Images • Histograms and Entropy • Visual Perception of the Image • Image Quality and Noise in Images • Color (overview) and Cameras (overview)
Session5 (Week7-8)	Data Structures for Image Analysis • Levels of Image Data Representation • Traditional Image Data Structures
Session6 (Week8 -9)	Matrices, Chains, Topological Data Structures, Relational Structures and Hierarchical Data Structures Pyramids, Quadtrees and Other Pyramidal Structures
Session7 (Week9 - 10)	Image compression and recognition: Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, JPEG standard, MPEG. Boundary representation, Boundary description, Fourier Descriptor, Regional Descriptors –
Session8 (Week 11)	Topological feature, Texture - Patterns and Pattern classes - Recognition based on matching.
Session 9 (Week 12)	Image Pre-Processing Pixel Brightness Transformations Position-Dependent Brightness Correction Gray-Scale Transformation Geometric Transformations
Session 10 (Week 12)	Pixel Co-ordinate Transformations Brightness Interpolation Local Pre-Processing

	Image Smoothing Edge Detectors
Session 11 (Week 12)	Zero-Crossings of the Second Derivative Scale in Image Processing (overview) Canny Edge Detection (overview) Local pre-processing in the frequency domain Image Restoration
Session 12 (Week 14)	**Midterm Exam**
Session13 (Week15-16)	Degradations That are Easy to Restore Inverse Filtration , Segmentation I Thresholding Threshold Detection Methods Optimal Thresholding Edge-based Segmentation, Edge Image Thresholding, Edge Relaxation
Session14 (Week16-17)	Border Tracing and Border Detection as Graph Searching Border Detection as Dynamic Programming Hough Transform Region-based Segmentation Region Merging Region Splitting Splitting and Merging
Session15 (Week18-19)	Watershed Segmentation Region Growing Post-Processing Matching and Matching Criteria Evaluation Issues in Segmentation Supervised Evaluation Unsupervised Evaluation
Session 16 (Week 20 - 21)	The Image, its Mathematical and Physical Background Overview Linearity The Dirac Distribution and Convolution Linear Integral Transforms Images as Linear Systems Introduction to Linear Integral Transforms 1D Fourier Transform 2D Fourier Transform Sampling and the Shannon Constraint Discrete Cosine Transform
Session 17 (Week22-23)	• Image Data Compression • Image Data Properties • Discrete Image Transforms in Image Data Compression
Session18 (Week24-26)	Image Segmentation: Introduction, Detection of isolated points, line detection, Edge detection, Edge linking, Region based segmentation- Region growing, split and merge technique, local processing, regional processing, Hough transform, Segmentation using Threshold.

Session 19 (Week 27 -28)	Image Enhancement In Frequency Domain: Introduction, Fourier Transform, Discrete Fourier Transform (DFT), properties of DFT , Discrete Cosine Transform (DCT), Image filtering in frequency domain.
Session 20 (Week 29)	Revision and discussion
Session21 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Imaging Equipment's

1	**Course name**	**Medical Imaging Equipment's**
2	**Course Code**	DE404
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of Fundamentals of Medical Imaging such as the foundations, components and operation of the medical imaging system and includes the steps of data collection and processing, image formation, display and quality.
Textbooks required for this Course:	• Fundamentals of Medical Imaging 3rd Editionby Paul Suetens, Katholieke Universiteit Leuven, Belgium, May 2017 ISBN: 9781107159785

	• Medical Imaging Technology by Victor Mikla, Victor Mikla 1st Edition - July 30, 2013 • https://wwwpub.iaea.org/mtcd/publications/pdf/pub1564webnew-74666420.pdf • Manual of radiographic equipment by Stockley, S M 1986 • Equipment for Diagnostic Radiography by E. Forster 1985 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Compare and contrast conventional and digital equipment. • Explain the physics of x-ray production. • Describe basic x-ray circuits. • Relate conventional and digital equipment components to the imaging process • Understand the foundations, components and operation of the medical imaging system and includes the steps of data collection and processing, image formation, display and quality, errors that occur during imaging, and ways to address them, in addition to discussing ways to protect the patient during imaging. • Gain the knowledge of factors which govern and influence the production of the radiographic image. • Acquaint the knowledge of radiographic image processing. • Describe of for the analog and digital processing and introducing Image receptors. • Describe processing procedures and artifacts . • Evaluate radiographs for the proper density, contrast, detail, noise and artifacts. • Acquaint digital and analog receptors and compare their properties.
Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam practical. A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Medical Imaging introduces the student to the principles and practices of medical imaging. The function of radiographer and their relationship with the health care team is stressed. The student is also oriented to the hospital environment and health care systems.
Session 2 (Week 2)	Medical Terminology . This course introduces the student to medical terminology. Emphasis is placed on terminology pertinent to diagnostic radiology.

Session 3 (Week 3)	• Medical Imaging Procedures • course emphasizing routine and specialized procedures used in diagnostic radiology.
Session 4 (Week 4)	Anatomy and Physiology . Human anatomy, emphasizing the body tissues and systems, is included. Emphasis is placed on the skeletal system and other systems closely associated with imaging.
Session5 (Week5)	-Physical Principles of Imaging Fundamentals of radiologic physics and its application to diagnostic radiology are covered.
Session 6 (Week 6)	The rudiments of basic physics and elementary principles of electricity and magnetism required for understanding x-ray production and interaction. - Medical Imaging Safety.
Session 6 (Week 6)	.Radiation protection, personnel monitoring, radiation shielding, and patient protection are introduced in this course. Emphasis is placed on protection mechanisms utilized in diagnostic radiology. Safety issues related to CT and MRI are also presented.
Session 7 (Week 7)	Principles of Radiographic Technique. Factors regulating the four radiographic qualities of receptor exposure, contrast, spatial resolution, and distortion are emphasized. Students acquire the skills necessary to adapt technical factors in order to produce diagnostic radiographs in the digital imaging environment
Session 8 (Week 8)	• Image Processing Technique . Current trends in the processing, analysis, manipulation, and display of digital radiographic images. Capture of image data from CR and DR detectors is discussed. Pre- and post- image processing operations are presented.
Session 9 (Week 9)	The calculation and evaluation of exposure indicators is explained. The practical application of radiographic techniques, technique myths, and image evaluation in digital imaging are discussed. Digital image artifacts are also explained.
Session 10 (Week 10)	Imaging Equipment Prerequisites: This course introduces the student to the different types of imaging systems. The basic principles of digital imaging, CT, MRI, interventional radiology and mammography equipment are presented.
Session 11(Week 11)	Radiation Biology .Prerequisites: organisms following absorption of energy from ionizing radiation. Interactions of radiation in matter, short and long-term biological effects, and cell survival kinetics are emphasized.
Session 12(Week 12)	Quality Control . Prerequisites: This course focuses on external factors affecting the quality of an image. Emphasis is placed on healthcare and imaging accrediting bodies, radiographic equipment evaluation, and repeat analysis. It includes didactic and lab components.
Session 13(Week 13)	The X-ray Tube 1. Six support designs for the x-ray tube. 2. Protective components of the tube housing.

	3. The components of the glass or metal envelope that comprise the x-ray tube. 4. Cathode and filament current. 5. Parts of the anode and the induction motor that spins the rotating anode. 6. The three causes of x-ray tube failure. 7. Use of tube rating charts to prevent tube failure.
Session 14(Week 14 - 15)	Digital X-ray Imaging 1. the frequency of use of digital imaging in modern diagnostic imaging departments. 2. Relate the research and development of digital imaging. 3. Characteristics of digital images, specifically image matrix and dynamic range. 4. Parts of a digital fluoroscopy system and their functions. 5. Components and use of a digital radiography system.
Session 15(Week 16)	**Midterm Exam**
	Picture archiving (PACS, Radiology Information System and Hospital Information Systems) and teleradiology systems used in diagnostic imaging departments. Computer literacy proficiency in order to operate various digital, medical documentation, and image acquisition systems.
Session 16(Week 17)	• CT Physics and Instrumentation . Physics topics covered include the characteristics of radiation, CT, beam attenuation, linear attenuation coefficients, tissue characteristics, and Hounsfield number application.
Session 17(Week 18 - 19)	Data acquisition and manipulation techniques and image reconstruction algorithms will be explained. CT systems and operations will be fully explained. CT Procedures Summer, Fall, and Spring. Credit, six hours total. CT protocols will be taught for differentiation of specific structures and pathology.
Session 18(Week 20 - 21)	Patient history, education and preparation, contrast media type, amount and administration route, patient positioning and orientation, scan parameters, image display and common pathology will be covered.
Session19 (Week22)	• Physical principles of medical ultrasound imaging Doppler ultrasound methods Bioeffects, dosimetry and safety of ultrasound
Session20 (Week23)	Application of ultrasound in therapy Quality assurance in ultrasound
Session21 (Week24 -25)	Physics of nuclear medicine and equipment: technologists about the basics of radioactivity and their applications in the field of Nuclear Medicine along with the constructions and working principles of Nuclear Medicine equipments.
Session22 (Week26)	Single photon emission tomography (SPECT) Positron emission tomography
Session 23 (Week 27)	(PET) Magnetic resonance imaging (MRI) Devices for radiation oncology treatment planning.
Session 24 (Week 28)	Revision and discussion

Session25(Week 29-30)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Information

1	**Course name**	**Medical Information**
2	**Course Code**	**DE405**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to give the student a working knowledge of health care delivery systems; the health information profession; the definition and the purpose of the medical record; the systems and processes for collecting, maintaining and disseminating health information; numbering, retention and storage of medical information; forms control and design; indexes and registers; release of patient information, security, privacy, confidentiality, and ethical issues; documentation requirements; regulatory requirements of healthcare organization, accrediting and licensing agencies, and computerized information management systems utilized by health information management departments.
Textbooks required for this Course:	• The Merck Manual of Medical Information: Second Home Edition (Merck Manual of Medical Information Home Edition) by Mark H. Beers 2008

	• Healthcare Information Systems 2nd edition Edited by Kevin Beaver 2019 • Wager, K. A., Lee, F. W., & Glaser, J. P. (2017). Health care information systems: A practical approach for health care management -4th Edition. By Jossey-Bass. • Trotter, F. and Uhlman, D. (2011). Hacking healthcare: A guide to standards, workflows, and meaningful use O'Reilly Media. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	By the completion of the course the students should be able to: • Demonstrate knowledge of the development of the health information management profession and the evolutions in it to accommodate the changes in the healthcare environment. • Know the responsibilities of healthcare professionals. • Identify the roles and responsibilities of health information management professionals in the development and maintenance of health record systems. • Identify the typical functions performed by the health information management (HIM) department. • Do different operational techniques for managing traditional HIM functions. • Demonstrate knowledge of the interrelationship between the HIM department and other key departments within the healthcare organization. g. Demonstrate knowledge of several techniques used in the management of the HIM department, such as policy and procedure development and the budgeting process. • Identify the role of the health information management professional in creating and maintaining secondary records. • Do pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving, and decision making, driven by efforts to improve human health. • Understand biomedical informatics where information applied to, or studied in the context of biomedicine. • Giving the latest update about medical information. • Get better understanding users' needs and the context of information use.

Course Assessments	Midterm exam 20 % 10% Attendances 10% Activities. 60 % Final Exam practical. A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1-3 (Week 1-3)	INTRODUCTION TO COMPUTERS Introduction, electronic components of the CPU, Microprocessor chip, motherboard. Computer as a digital calculator, principle of digital computers, structure of the digital computers: arithmetic unit, central unit, memory unit, Input and output.
Session 4-6 (Week 4-6)	HISTORY AND DEVELOPMENT OF COMPUTERS Generations of computers; (I, II, III, IV and V), classifications of computers; analog computers, digital computers, mainframe, and mini-frame computers
Session 7-11 (Week 7-11)	• DATA INPUT OUTPUT, MEMORY AND COMPUTER CODING DATA INPUT OUTPUT: Punched card reader, paper tape reader, magnetic tape, floppy disk, magnetic disk, optimal scanner, voice data, data entry terminal, teleprocessing monitor, visual display unit, modern input devices, Output devices; CRT, printer, plotter
Session 12-13 (Week 12-13)	• MEMORY: Primary memory or main memory; magnetic core memory, semi-conductor memory, RAM, ROM, PROM, EPROM, EEPROM. Secondary memory or auxiliary memory or storage devices; Hard disk, diskette, magnetic tape, ZIP disk devices, CD-ROM, DVD, virtual memory, cache memory. COMPUTER CODING: Number system, binary number system, decimal number system, binary to decimal inter conversion, octal number system, hexadecimal number system, fundamentals of logical concepts
Session 14(Week 14)	**Midterm Exam**
Session 15 (Week 15)	• LANGUAGES, FLOW CHARTS AND OPERATING SYSTEMS Machine level languages, assembly level languages, high level languages
Session 16 (Week 16-17)	• OPERATING SYSTEMS: DOS, windows, UNIX/LINUX, Mac OS. MODERN COMPUTING MACHINES: Workstations, parallel processing computers, HPC, supercomputers, zero client system. INTERNET AND
Session 17 (Week 17-18)	RELATED PROGRAMMES: History of Networking and internet, WWW, HTML, HTTP, telnet, FTP, computer domains, internet browsers, TCP/IP, LISTSERV
Session 18(Week 19-21)	• HEALTH SCIENCE INFORMATICS Introduction to information, scope, components of heath care informatics; introduction, standardized languages in practice. Health IT architecture; information technology architecture models in health care organization, service oriented structures. Concept of bio-signal processing and medical imaging.
Session 19 (Week 22-25)	• Medical Data Storage and Automation: AUTOMATION modeling Techniques, Relational Hierarchical and network Approach,

	Normalization techniques for Data handling - Plug-in Data Acquisition and Control Boards – Data Acquisition using Serial Interface – Medical Data formats – Signal, Image and Video Formats –Medical Databases - Automation in clinical laboratories - Intelligent Laboratory Information System – PACS
Session 20 (Week 26-27)	Medical Expert Systems, Virtual reality applications in medicine, Radiation therapy and planning – Telemedicine – virtual Hospitals Smart Medical Homes – Personalized e-health services – Biometrics - GRID and Cloud Computing in Medicine.
Session 22(Week 28-29)	Revision and discussion
Session 23 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospital Engineering

1	**Course name**	**Hospital Engineering**
2	**Course Code**	**DE406**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the course and will provide students with an undergraduate education in the field of hospital engineering. This foundation degree aims to offer an enjoyable, intellectually demanding and stimulating programme of study and to create graduates who understand technology principles associated with Hospital Engineering.
Textbooks required for this Course:	• Hospital engineering handbook Hardcover ISBN 10: 087258125X ISBN 13: 9780872581258 Publisher: American Hospital Association, 1974 • Technician's Handbook for Hospital Engineering by Neureiter, J Tschank, A 1989 • Management Engineering for Effective Healthcare Delivery: Principles and Applications Alexander Kolker and Pierce Story 2011 DOI: 10.4018/978-1-60960-872-9 • Clinical Engineering: A Handbook for Clinical and Biomedical Engineers.Edition: 1stPublisher: ElsevierEditor: A.F.G. Taktak, P. Ganney, D. Long and P. White 2013 • Clinical Engineering Handbook by Joseph Dyro1st Edition - August 27, 2004 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion.
Course Objectives:	Upon completion of this course, students will be prepared to: • Lead healthcare technology implementation and improvement by working with clinicians and administrators • Identify technology needs and gaps • Assess existing technologies • Plan, negotiate and acquire medical equipment using life-cycle cost analysis techniques • Manage installations and integration of new systems

	• Perform clinical staff assessment and training • Ensure all safety standards and regulatory compliance are met • Manage the technology during its useful life • Plan and prioritize eventual replacement • Investigate technology related incidents and accidents, coordinate with medical staff, risk managers, and manufacturers to identify high risk technologies, investigate root causes of incidents, remediate technical and procedural deficiencies using failure modes and effects analysis, identify process improvements to advance patient safety, and file reports with management, regulators, and other stakeholders. • Evaluate and specify utility systems which connect to medical equipment, such as electrical power, medical gases, ventilation systems and illumination methods. Evaluate and measure environmental risks which are found in the healthcare setting such as electromagnetic interference, radiation safety, electrical safety in the patient environment, fire protection, indoor air quality and disaster planning. • Design, analyze, and implement methods to interconnect medical devices to the hospital's computer network to transfer patient data to the electronic medical record. Understanding medical device security, patient information security, the role of middleware and clinical information systems.
Course Assessments	Midterm Exam 20% Activities 10% Attendances 10% Final Exam: 60% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• sanatorium facilities
Session 2 (Week 2)	Hospital classification
Session 3 (Week 3)	Hospital department design considerations
Session 4 (Week 4)	• hospital items
Session 5 (Week 5)	• Hospital motion lines
Session 6 (Week 6)	• Architectural composition of the hospital
Session7-10(Week7-10)	• Definition and classification of the interior spaces of the patient wards
Session11-14(Week11-14)	• Space organization and health performance efficiency
Session 15 (Week 15)	**Midterm Exam**
Session 16 (Week 16)	Types of space organization for patient accommodation suites
Session 17-20(Week17-20)	Factors affecting the systems of collecting patient accommodation suites
Session 21-23(Week21-23)	Theoretical framework of the basic concepts to achieve the health performance efficiency of patient wards
Session 24-26(Week24-26)	Features of efficient space organization of patient accommodation wards.
Session 27 (Week 27)	Field visits
Session 28-29(Week28-29)	Revision and discussion

Session 30-32(Week30-32)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Neural Networks

1	**Course name**	**Neural Networks**
2	**Course Code**	DE407
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Devices and Equipment Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of at least three abilities: acquire information, have a structure which is flexible enough to represent and integrate information, and have a mechanism to adapt itself to the environment using the acquired information
Textbooks required for this Course:	• https://www.inf.ed.ac.uk/teaching/courses/nlu/assets/reading/Gurney_et_al.pdf • An Introduction to Neural Networks 1st edition By Kevin Gurney1997 • Neural Networks and Deep Learning: A Textbook by Charu C. Aggarwal January 2018, DOI: 10.1007/978-3-319-94463- • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours

Delivery	Lecture-based, Group interaction and discussion.
Course Objectives:	Upon completion of the course, students should be prepared to: • Comfortable with tools and techniques required in handling large amounts of datasets • Uncovervarious deep learning methods in NLP, Neural Networks etc • Use and illustrate several libraries and datasets publicly available • Developing skills required to gain experience of doing independent research and study • Know neuron models: McCulloch-Pitts model and the generalized one, distance or similarity based neuron model, radial basis function model, etc. • Understand the Basic neural network models: multilayer perceptron, distance or similarity based neural networks, associative memory and self-organizing feature map, radial basis function based multilayer perceptron, neural network decision trees, etc. • Learn basic algorithms: the delta learning rule, the back propagation algorithm, self-organization learning, the r4-rule, etc. • Use the applications: pattern recognition, function approximation, information visualization, etc.
Course Assessments	Midterm Exam 20 % Activities 10 % Attendances 10% Final Exam:60 % A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	▪ introduction ▪ history
Session 2 (Week 2)	• processing units • Hebbian learning • linear models (regression) • LMS algorithm
Session 3 (Week 3)	• Perceptrons (classification) • limitations of linear nets and perceptrons
Session 4 (Week 4)	▪ activation functions ▪ error functions ▪ back propagation
Session5-6(Week5-6)	▪ Convolutional Neural Networks ▪ Motivation (Neuroscience) ▪ Convolutional layers ▪ Additional layers

	▪ Residual Nets ▪ Examples
Session 7-8 (Week 7-8)	▪ Recurrent Neural Networks ▪ Motivation (Neuroscience) ▪ Sequential Processing ▪ Stability ▪ Gated Nets (LSTM, GRU) ▪ Examples
Session 9 (Week 9)	▪ bias-variance dilemma ▪ overfitting ▪ inductive bias
Session 10 (Week 10)	▪ regularization ▪ drop out
Session11-13(Week11-13)	• Adversarial Approaches to ANN / Generative Adversarial Neural Networks ○ Adversaries ○ Generator-Discriminator ○ Stab
Session 14 (Week 14)	**Midterm Exam**
Session15 (Week15-18)	Reinforcement Learning / Unsupervised learning
Session16 (Week19-23)	• Training Neural Networks ○ Loss ○ Training/Validating/Testing ○ Gradient Descent ○ Stochastic Gradient Descent ○ ADAM
Session17(Week24-26)	• Topics in Constructing and Training Neural Networks ○ Operators ○ Drop out ○ Initialization ○ Normalization ○ Additional
Session18(Week27-28)	Advanced Topics • Optimization ○ Hyper-Parameter ○ Advanced Optimization • Prunin
Session 19 (Week 29)	Revision and Discussion
Session20 (Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.

Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ثامنا: المقررات الدراسية لقسم صحة المجتمع

أ - المقررات الدراسية للسنة الثانية قسم صحة المجتمع

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended). • Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems;

	• Describe the major cavities of the body and the organs they contain. • Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system • Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder)

	• Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color • Receptors and glands • Skin burns and disorders • Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts
Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion

Session 15 (Week 30-32)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840.

	• Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis. • The metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science. • The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**

Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Microbiology

1	**Course name**	General Microbiology
2	**Course Code**	MT203
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables students to know: * The microorganism and definition of all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells. *Methods and types sterilization and disinfectant. * Culturing and cultivation of Microorganisms and basic way of their identifications
Textbooks required for this Course:	• Text book of microbiology First Published in 2010 by Prem C. Bakliwal forAavishkar Publishers ISBN 978-81-7910-306-7. • https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf • https://open.umn.edu/opentextbooks/textbooks/873 • https://www.britannica.com/science/microbiology • https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/1%3A_Introduction_to_Microbiology • https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells. • Comprehend the fundamentals of molecular microbiology.

	• Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present. • Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health. • Understand Microbial Cell Structure, Function and methabolism.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction, of microbiology
Session 2 (Week 2)	History of Microbiology
Session 2 (Week 3)	• Defining Microbes and Basic concepts and scope of microbiology
Session 3 (Week 4)	Pasteur and spontaneous Generation
Session 4 (Week 5 & 6)	Types of microorganisms
Session 5(Week 7,8)	Classification of microorganisms
Session6(Week 9)	Immunization, antiseptics and antibiotics
Session 7(Week 10)	Microscopy
Session 8(Week 11)	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
Session9(Week 12)	Bacterial structure& composition
Session10(Week 13)	Bacterial Genetics
Session11(Week 14 & 15)	Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
Session12(Week 16)	**Midterm exam**
Session13(Week 17)	Isolation and culturing of Bacteria
Session14(Week 18 & 19)	Microbial metabolism
Session15(Week 20)	Classification of bactria
Session16(Week 21)	Dyes and staining (gram stain, acid fast staining, and other staining metods).
Session17(Week22 & 23)	Fungi: 1. what is mycology? 2. Classification and structure 3. Moulds, yeasts and dimorphic fungus. Fungal diseases Algae: 4. Characteristics, structure and division of algae
Session18(Week 24 & 25,26)	Viruses 1. Definition, Characteristics, symmetry and structure of viruses, 2. Classification and growth of Viruses. 3. Detection, multiplication of Viruses. 4. Laboratory methods used for viral detection
Session19(Week 27,28)	Parasites 1. Definition, Characteristics and structure of parasites,

	2. Summary of Parasitic Classification (Protozoa and Helminths). 3. Detection, multiplication of Protozoa and Helminths. 4. Laboratory methods used for viral detection
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Histology

1	**Course name**	Histology
2	**Course Code**	MT204
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Histology and Know the different types of tissues of the body Recognize the function performed by each tissue Learn about common terms and definitions used in histology
Textbooks required for this Course:	• DiFiore's atlasof histologywith functionalcorrelations. Junqueira'sBasic Histology. • Histology: An Essential Textbook by D. J. Lowrie Jr 2020 • Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021 • Textbook of Histology by Leslie P. Gartner PhD 2021

	• Histology: A Text and Atlas 7th edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015 • Wheater's Functional Histology: A Text and Colour Atlas 3rd edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire a basic background in histology and comparative histology in different and to understand the properties of cells and their interactions with one another as components of tissues and organs. • Understand how structure and function correlate at the microscopic level and be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination. • Understandthe changes that occur to tissues • Identify the different types of tissues • Recognize the types of tissues and the mechanisms of identifying them • understand the various diagnostic tools and medical equipment in the correct way to discover histological changes • Understand how to distinguish tissue and how it develops • deduce the causes of the changes that have occurred within the tissues
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to histology •histology and its mode of study
Session 2 (Week 2)	• The cell
Session 3 (Week 3)	• Epithelial Tissue
Session 4 (Week 4)	• Connective tissue
Session 5 (Week 5)	• Cartilage
Session 6 (Week 6)	• Bone
Session 7 (Week 7)	• Bone.
Session 8 (Week 8)	Muscle Tissue
Session 9 (Week 9)	Nerve Tissue

Session 10 (Week 10)	•Nervous System
Session 11 (Week 11)	The Immune System &
Session 12(Week 12)	Lymphoid Organs
Session 13(Week 13	Blood and Hemopoiesis
Session 14 (Week 14)	Endocrine System
Session 15(Week 15)	Hormones
Session 16(Week 16)	The integumentary system
Session 17 (Week 17)	The Circulatory system
Session 18 (Week 18)	The Circulatory system
Session 19 (Week 19)	The Circulatory system
Session 20 (Week 20)	Respiratory system
Session 21 (Week 21)	Respiratory system
Session 22 (Week 22)	Respiratory system
Session 23 (Week 23)	Digestive system
Session 24 (Week 24)	The urinary system
Session 25 (Week 25)	The urinary system
Session26(Week26- 27)	Reproductive system
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Medical Laboratories
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and

	relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪ ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle

	• Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex

Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney •Urine formation •Micturition •Renal failure •Male reproductive •Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland Parathyriod Adernal gland Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised..

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002.

	• Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985. • Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be famillar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.

Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell
Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development.

	• Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments.

	• Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**
Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal

	communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	The objective of the course is: • To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner

	• Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 1. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management;

	• Develop the basic management skills and ability to work productively with others; • Learn to select, use, and critically analyze current HCMN research and literature; • Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	**Midterm Exam**
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology

	Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources
Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Fundamentals of Nursing

1	**Course name**	**Fundamentals of Nursing**
2	**Course Code**	**PH202**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course introduces classic nursing principles that underpin future clinical practice. Principles include such things as comfort measures, assistance with daily living activities, environmental concerns, positioning and transporting, asepsis and sterile technique, medication administration, intrusive therapies and use of the nursing process with particular emphasis on the intervention component. The majority of the theoretical information is provided through an online environment. Concepts related to nursing fundamentals and nursing care is integrated throughout the course. The campus laboratory and clinical settings will afford practical experience in application of the principles and skills taught in the theory portion of this class. Students will be expected to demonstrate beginning competency in application of the nursing process.
Textbooks required for this Course:	• Fundamentals of Nursing 4th edition by Sue C. DeLaune, MN, RN 2010 • file:///C:/Users/BMI/Downloads/fundamentals_of_nurisng_.pdf • Standards & PracticeBerman, A., & Snyder, S. (2015). Kozier and Erb's fundamentals of nursing (10th Ed.). New Jersey: Pearson. (ISBN:978-0133974362). • Carpenito, Lynda (2017) Handbook of Nursing Diagnosis (15th Ed.). Philadelphia: Lippincott Williams & Wilkins (ISBN: 978-1496338396). • Chabner, D.E. (2015). Medical terminology-a short course (with access code). (7th ed.) Maryland Heights, MO: Saunders. ISBN: 978-1455772674. • Hogan, M. (2013). Nursing Fundamentals : Reviews and Rationales (3rd Ed.). Boston: Pearson. (ISBN: 978-0133083590) • Kee, J. L. (2014). Laboratory and diagnostic tests with nursing implications (9th. Ed.). Upper Saddle River, NJ: Pearson. (ISBN: 9780133139051). • Skidmore-Roth, L. (Consultant) Mosby's drug guide for nurses (most recent edition) • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion.
Course Objectives:	Upon completion of this course, the student will have reliably to: • Analyze the nature of the human using concepts and theories through the study of the arts, sciences, humanities and nursing to provide professional nursing care.

	• Integrate caring and cultural competence through the practice of professional nursing • Use critical thinking to make independent judgments in applying the nursing process in the delivery of healthcare to individuals, families, groups, organizations, communities and global populations • Use evidence-based nursing and health-related research findings in professional nursing practice. • Accept responsibility and accountability for personal and professional growth and development, and value the commitment of lifelong learning. • Utilize a full range of information technology skills and display a mature computer literacy to support and communicate the planning and provision of client care in a variety of settings. • Provide evidence- based clinically competent patient-centered care which represents the patients' preferences, values, and needs within the context of their families, communities and the health care delivery system. • Recognize threats to safety and develop strategies to minimize risk of harm to individuals and community • Apply organizational, leadership, and management concepts in the provision of high quality nursing care.
Course Assessments	Midterm Exam 20% Attendances 10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to nursing
Session 2 (Week 2)	Diversity in nursing
Session 3 (Week 3)	Health and illness
Session 4 (Week 4)	• Vital signs and its importance
Session 5 (Week 5)	• Health of individual, family and community
Session 6 (Week 6)	• Nursing theories, research and evidence based practice
Session 7 (Week 7)	• Healthcare delivery systems
Session 8 (Week 8)	**Midterm Exam**
Session 9 (Week 9)	• Home healthcare
Session 10 (Week 10)	Nursing process(assessment, diagnosing, planning, implementing and evaluating)
Session 11 (Week 11)	Prioritizing patient care (Maslow's hierarchy)
Session 12 (Week 12)	Basic role of nursing care

Session 13 (Week 13)	vital signs in adults
Session 14 (Week 14)	vital signs in young's
Session 15 (Week 15)	Venipuncture
Session 16 (Week 16)	Cannulation
Session 17 (Week 17)	intramuscular vaccine
Session 18 (Week 18)	subcutaneous vaccine
Session 19 (Week 19)	gynecology and obstetrics nursing
Session 20 (Week 20)	Review of nursing fundamentals module
Session 21 (Week 21)	Practical lecture 1
Session 22 (Week 22)	Practical lecture 2
Session 23 (Week 23)	Practical lecture 3
Session 24 (Week 24)	Practical lecture 4
Session 25 (Week 25)	Practical lecture 5
Session 26 (Week 26)	Review of practical lectures
Session 27 (Week 27)	Revision and discussion
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب. المقررات الدراسية للسنة الثالثة قسم صحة المجتمع

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra. • Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications. • http://www.pitt.edu/~super7/43011-44001/43911.ppt

	• http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 8 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research
Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem • Evaluation of a Problem Assignment 1 handed out

Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling • Meaning and Definition of Sampling • Functions of Population and Sampling

	• Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pathology

1	**Course name**	**Pathology**
2	**Course Code**	MT305
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	ENGLISH
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of the disease, including its causes, growth patterns, and consequences, plus investigation of those pathological mechanisms common to all tissue-cell pathology. Attention is paid to the processes of cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Robbins & Cotran Pathologic Basis of Disease (Robbins Pathology) 10th Edition by Vinay Kumar MBBS MD FRCPath Abul K. Abbas MBBS , Jon C. Aster MD PhD 2020 • Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744. • Textbook of pathology by Harsh Mohan 6th edition, ISBN: 978-81-8448-702-2, 2010. • https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the common terms and definitions used in pathology • Identify of the nature of the disease, including its causes, growth patterns, and consequences • Recognizethe biological characteristics that distinguish each disease from the other.

	• The ability to distinguish the origin of the disease and how it develops The ability to distinguish the origin of the disease and how it develops •That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment •The student will infer the causes of disease and its growth patterns •The student determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• **Introduction to pathology** • Pathology gives explanations of a disease by studying the following four aspects of the disease 1. Aetiology 2. Pathogenesis 3. Morphologic changes 4. Functional derangements and clinical significance •The causes of disease Environmental factors Genetic Factors
Session 2 (Week 2)	**Cell injury.** - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury (Reversible & Irreversible cell injury).
Session 3 (Week 3)	**Cell injury.** - Free radicals (sources, effects & destruction of FR). - Cell injury by chemicals and Cell injury by viruses.
Session 4(Week 4)	**Cell injury.** - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
Session 5 (Week 5)	• **Inflammation .** a. Acute inflammation & its types.
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	• **Repair and healing.**
Session 8 (Week 8)	• **Infectious diseases.** a. Bacterial, Viral, Fungal and Parasitic infection - a general outline b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis & Hydatid disease.
Session 9 (Week 9)	•**Immunopathology.** 1. Immune mechanism of tissue injury: a. Type I hypersensitivity. b. Type II hypersensitivity. c. Type III hypersensitivity. d. Type IV hypersensitivity. e. Tissue transplantation.
Session 10 (Week 10)	2. Autoimmune diseases:

	a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis. c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
Session 11(Week 11)	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
Session 12(Week 12)	• **Nutrition disorder.** Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• **Ionizing radiation**. a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• **Hemodynamic disorders** Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	**GENETIC DISORDERS** a. Single - Gene Defect "Mendalian Disorders" b. Disorders with Multifactorial Inheritance
Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• **Neoplasia.** - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	**Respiratory diseases.** Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	**Cardiovascular diseases .** - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28)	**Revision and discussion**
Session 22(Week29 - 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition. The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Principles of Epidemiology

1	**Course name**	**Principles of Epidemiology**
2	**Course Code**	PH303
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	In this introductory course, students will learn and apply basic concepts of epidemiology to multiple domains of public health. We will illustrate and practice using epidemiology to better understand, characterize, and promote health at a population level. The class will engage the students in active and collaborative learning through team activities, individual projects, case studies, group discussion, and individual projects.
Textbooks required for this Course:	• Principles of Epidemiology A Self-Teaching Guide1st Edition - January 1, 1982 ISBN: 9781483276342. • Epidemiology: Principles and Practical Guidelines • 2013 ISBN : 978-94-007-5988-6 • Resources located on the course Sakai website: ERIC Notebooks (epidemiology methods periodical) Additional handouts and readings Links to journal articles or other readings on the Internet. Instructions for case studies, individual assignments, and team project • Rothman KJ. Epidemiology: An Introduction. New York, NY. • Gordis L. Epidemology, 3rd Ed. Philadelphia, PA. Elsevier Saunders: 2004 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to:

	Understand where the disease is coming from, and who it is most likely to impact. Discover patterns and trends in health problems. Predict the number of cases of a disease and its distribution in the population. Explain the etiology of disease. Study the course of a disease quantitatively from onset to outcome. Assess preventive measures and treatment options.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Basic principles of epidemiology
Session 2 (Week 2)	Basic principles of epidemiology 2
Session 3 (Week 3)	General Health and Population Indicators
Session 4 (Week 4)	Tools of Epidemiology: measuring disease Frequency (Prevalence, incidence, morbidity rates, attack rates, etc.).
Session 5 (Week 5)	• Measures of morbidity
Session 6 (Week 6)	• Measures of morbidity 2
Session 7 (Week 7)	• Review of the previous lectures
Session 8 (Week 8)	• Measures of mortality
Session 9 (Week 9)	Measures of mortality 2
Session 10 (Week 10)	Direct age adjustment
Session 11 (Week 11)	Indirect age adjustment
Session 12 (Week 12)	Principles of prevention
Session 13 (Week 13)	Principles of control
Session 14(Week 14)	**Midterm Exam**
Session 15 (Week 15)	Principles of surveillance
Session 16 (Week 16)	Screening
Session 17 (Week 17)	Epidemic management
Session 18 (Week 18)	International classification of diseases
Session 19 (Week 19)	Communicable diseases

Session 20 (Week 20)	Non-communicable diseases
Session 21 (Week 21)	Overview of study designs
Session 22 (Week 22)	Qualitative studies
Session 23 (Week 23)	Quantitative study
Session 24 (Week 24)	How to select the suitable study design?
Session 25 (Week 25)	Errors in epidemiological studies
Session 26 (Week 26)	Epidemiology and Biostatistics
Session 27 (Week 27)	Review
Session 28 (Week 28)	Discussion and revision
Session 29(Week29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Family Health

1	**Course name**	**Family Health**
2	**Course Code**	**PH304**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is designed to further develop the concepts within the three domains of the individual, healthcare, and nursing. Emphasis is placed on the concepts of oxygenation, sexuality, reproduction, grief/loss, mood/affect, behaviors, development, family, health-wellnessillness, communication, caring interventions, managing care, safety, and advocacy.
Textbooks required for this Course:	• McWhinney's Textbook of Family Medicine, 4th Edition January 2016 Edition: Fourth edition Publisher: Oxford University PressISBN: 978-0-19-937068-9 • The Johns Hopkins Family Health Book: The Essential Home Medical Reference to Help You and Your Family Promote Good Health and Manage Illness Hardcover – December 30, 1998. • https://bookauthority.org/books/best-family-health-books • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Develop an understanding of the foundational pillars of family and community health nursing in Canada. • Outline and analyze the implications of societal trends and social determinants of health on the health of individuals, families, groups, and communities. • Demonstrate an appreciation of the diversity, trends, and evolving nature of families, groups, and communities. • Develop a beginning understanding of supportive and empowering strategies to build individual and community capacity for self-advocacy. • Recognize healthy public policies and public health policies and services that promotes and protects the health of individuals, families, and communities in the context of health and social inequities. • Understand the research process and evidence informed practice and to use literacy skills as they apply to community and family nursing.
Course Assessments	Midterm Exam 20% Attendances 10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to family health

Session 2 (Week 2)	Factors affecting health of families
Session 3 (Week 3)	Millennium developmental goals
Session 4 (Week 4)	Millennium developmental goals (2)
Session 5 (Week 5)	Millennium developmental goals (3)
Session 6 (Week 6)	Gender issue in health
Session 7 (Week 7)	Empowerment of women
Session 8 (Week 8)	Population dynamics and its effect on family health
Session 9 (Week 9)	Health informatics in family health
Session 10 (Week 10)	Safe motherhood
Session 11 (Week 11)	Early childhood development
Session 12 (Week 12)	Violence
Session 13 (Week 13)	Child survival and development strategies
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	Improving of family health
Session 16 (Week 16)	quality of life in elderly
Session 17 (Week 17)	Adolescent health
Session 18 (Week 18)	Persons with special needs
Session 19 (Week 19- 20)	Community nutrition and nutritional needs throughout the life cycle
Session 20 (Week 21)	Nutrition of school children
Session 21 (Week 22)	Role of public health specialists
Session 22 (Week 23)	Health counselling
Session 23 (Week 24)	Health education
Session 24 (Week 25)	Health promotion
Session 25 (Week 26)	Student presentations (assignment)
Session 26 (Week 27)	Student presentations (assignment)
Session 27 (Week 28)	Revision and disscusion
Session 29 (Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.

Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

School Health

1	**Course name**	**School Health**
2	**Course Code**	**PH305**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of health education focusing on what they can do to promote good health and well-being, making clear connections to their immediate environment and health information, concepts, skills, and behaviors and how they can assume more responsibility for their health, develop positive health behaviors, and prevent negative, unhealthy behaviors.
Textbooks required for this Course:	• https://www.textbooks.com/Catalog/PEP/Health-Education.php • Essentials of School Health and Educational Medicine: A Manual for School Health and Primary Health Care Workers Paperback – December 27, 2011by Mostafa Abolfotouh. • Comprehensive Health Skills for Middle School, Workbook by Mary McCarley 1st edition 2018

	• https://jamanetwork.com/journals/jama/article-abstract/305222 • School Health Policy & Practice 7th Edition by Rani S. Gereige, MD, MPH, FAAP; Elisa A. Zenni, MD, FAAP 2016, DOI: https://doi.org/10.1542/9781581108453 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Achieve health literacy • Acquire valid reliable scientific health knowledge • use that knowledge in a health promoting manner • Demonstrate a mastery of content knowledge and skills through written assessments, journal writing, and projects. • Access health information and services in order to make health promoting choices. • Engage in self management/behavior management to prepare for college. • Analyze influences on our health and well and identify health risk behaviors and interventions • Involved with interpersonal communications with health advocates as well as medical professionals. • Develop the skills necessary to weigh options to make responsible decisions and to develop behaviors that promote healthy lifestyles. • Encouraged to assess their attitudes and behavior patterns and understand the impact their health choices have on their communities and their own well-being • Recognizing the child as a change agent in the family.
Course Assessments	Midterm Exam 20% Attendances 10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Introduction to Health** What is Health? and Health Triangle

Session 2 (Week 2)	**Introduction to Health:** Health education and Family Medical History
Session 3 (Week 3)	**School health program:** Components of school health program and the goals of school health program
Session 4 (Week 4)	**Counseling:** Health education and Health promotion
Session 5 (Week 5)	**Counseling:** School Health counseling and Family involvement
Session 6 (Week 6)	**School health screening:** What is screening, Importance of screening, Oral screening and Vision screening.
Session 7 (Week 7)	**School health screening:** Hearing screening, Physical examination, Body mass index screening, Substance use prevention screening and Postural screening
Session 8 (Week 8)	**Vaccination**: Definition of vaccine and vaccination and Importance of vaccination
Session 9 (Week 9)	**Vaccination:** Routine Immunizations in Libya, recommended vaccines, Additional recommendations and Vaccines recommended for pupils.
Session 10 (Week 10)	**Healthy environment:** Characteristics of healthy school environment, Water, sanitation and hygiene
Session 11 (Week 11)	**Healthy environment:** Importance of healthy school environment and Safety of school environment
Session 12 (Week 12)	**Physical Health education:** Assessing Physical Health and Physical health importance
Session 13 (Week 13)	**Physical Health education:** Improving Physical Health and Personal Goal Based Fitness Plans
Session 14 (Week 14)	**Nutrition of school pupils:** Vegan Diet and Basic 5 Food Groups
Session 15 (Week 15)	**Midterm Exam**
Session 16 (Week 16)	**Nutrition of school pupils:** Vitamins and Minerals, Calorie Intake and Meal Plan on a Budget
Session 17 (Week 17)	**Tobacco, Alcohol and Other Drugs:** Impact on the Body and Mind and Refusing Through Peer Pressure
Session 18 (Week 18)	**Tobacco, Alcohol and Other Drugs:** How to avoid?
Session 19 (Week 19)	**Mental/Emotional Health:** Mental Health Conditions
Session 20 (Week 20)	**Mental/Emotional Health:** Healthy Outlets and Suicide Prevention
Session 21 (Week 21)	**Sexual and reproductive health education:** Birth Controls and Communicable Diseases

Session 22 (Week22-23)	**Sexual and reproductive health education:** Birth Controls and Communicable Diseases
Session 23 (Week 24)	**Disease prevention:** non communicable diseases
Session 24 (Week 25)	**Prevention of substance abuse**.
Session 25 (Week 26)	**Violence prevention**
Session 26 (Week 27)	**Counselling and advising**
Session 27 (Week 28)	Revision and discussion
Session28(Week29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Public Health Laws

1	**Course name**	**Public Health Laws**
2	**Course Code**	**PH306**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of Law as an essential tool for furthering the public's health. Central to public health law are government attempts to address the health needs of communities. This interdisciplinary course explores the tension between the needs of the community and the rights of the individual, a dynamic present in most major law-based public health interventions, from water fluoridation to vaccination mandates to quarantine and isolation. In this course, students will examine law and policy applied to public health. Students will learn about the government's authority to address public health problems and legal protections from government action.
Textbooks required for this Course:	• Farnsworth A. An Introduction to the Legal System of the United States. New York, NY: Oxford, 2010, p. 163-172. • Fielding JE, Teutsch S, Breslow L. A Framework for Public Health in the United States. Public Health Rev. 2010; 32(1): 174-189. • Silverman RD. No more kidding around: restructuring non-medical childhood immunization exemptions to ensure public health protection, Ann Health L. 2003 Sum.; 12(2): 277-94. • Mello MM, Studdert DM, Parmet WE. Shifting vaccination politics – the end of personal-belief exemptions in California. N Engl J Med 2015 Jul. 22; (epub). • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	One academic year
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.

Course Objectives:	Upon completion of this course, the student hould have reliably to: • Understand the fundamental principles of law, ethics, and the legal system as they frame public health practice • Understand the role of government in creating the conditions for people to be healthy, • Know the principles of International Public Law and Human Rights Law • Understand how global (and regional) institutions in the health area are organized and operate: WTO, WHO, EU, NGOs/civil society • Interface between national and global law, human rights, trade/competition and health • Interpret and understand basic national and international law the health care sector • Understand the concept of global health governance • Analyze the relationship between international law and national health systems
Course Assessments	Midterm Exam 20% Attendances 10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to public health law
Session 2 (Week 2)	Fundamentals of public health and law
Session 3 (Week 3)	Exercising public health powers
Session 4 (Week 4)	Exercising public health powers: public health legal authority & police powers
Session 5 (Week 5)	Exercising public health powers: federalism & preemption
Session 6 (Week 6)	Exercising public health powers: autonomy & bodily integrity (immunizations)
Session 7 (Week 7)	Exercising public health powers: privacy (patient privacy and public health)
Session 8 (Week 8)	Exercising public health powers: freedom of expression
Session 9 (Week 9)	Exercising public health powers: criminalizing behaviors that undermine the public's health (HIV exposure)
Session 10 (Week 10)	Exercising public health powers: public health emergencies
Session 11 (Week 11)	Legal tools and policy considerations

Session 12 (Week 12)	Regulation
Session 13 (Week 13)	Regulation case study: food safety
Session 14 (Week 14)	Exercising public health powers: freedom of expression
Session 15 (Week 15)	Legislation
Session 16(Week 16)	**Midterm Exam**
Session 17 (Week 17)	Legislation case study: gun control
Session 18 (Week 18)	Litigation case study: tobacco
Session 19 (Week 19)	Public health policy
Session 20 (Week 20)	The role of evidence: community water fluoridation and oral health
Session 21 (Week 21)	Public health policy guest panel
Session 22 (Week 22)	New directions in public health law
Session 23 (Week 23)	Infrastructural laws: agency organization & duties
Session 24 (Week 24)	Interventional laws: obesity prevention
Session 25 (Week 25)	Incidental laws: improving conditions in which we live, learn, work, & play
Session 26 (Week 26)	Prevention and health reform
Session 27 (Week 27)	Health Policy
Session 28(Week 28)	Revision and discussion
Session 29(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

مكونة الوحدة الوطنية
الوزير
وزارة التعليم العالي والبحث العلمي

Primary Health Care

1	**Course name**	**Primary Health Care**
2	**Course Code**	**PH307**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of contemporary primary health care service delivery. Students will explore the emerging directions of primary health models of care from an international and national perspective. This will include universally evolving changes in burden of disease, national health reforms to meet challenges of evidenced based care, interaction between communities and their social and physical environment, influence of social and cultural determinants on health behavior and clinical governance
Textbooks required for this Course:	• An Introduction to Community and Primary Health Care 3rd Edition: ISBN: 9781108797832 • Guzys, D, Brown, R, Holcomb, E & Whitehead, D 2017, An introduction to Community and Primary Health Care, 2nd edn, Cambridge University Press, Cambridge, UK. • McMurray, A & Clendon, J 2018, Community Health and Wellness: Primary Health Care in Practice, 6th edn, Elsevier Health Sciences, Chatswood. (electronic version available from UTAS library) • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the primary health care philosophies which underpin practice,

	• Understand the socio-political environments in which care is delivered • Develop transferable management and communication skills. • Analyse, synthesise and critically evaluate the relationship and importance of the international and national public policy reforms for securing healthier communities, through Health Literacy and Health Promotion. • Demonstrate an advanced understanding of person- centred contemporary models of care that integrate public health with primary care, organised around people's needs and expectations to empower them in making appropriate health care decisions • Critically analyse the interaction between communities and their social and physical environment and the ways in which these factors may impact on a person's clinical presentation, access to health care and ability to comply to with a health plan within rural and remote areas • Apply established theories to research, critically analyse and synthesise information to discuss the role of epidemiology in understanding public health issues, risk factor management of National Health Priority conditions and emerging trends in Primary Health Care • Communicate and engage through consultation with Aboriginal and Torres Strait Islander populations to strengthen skills to achieve and maintain good health
Course Assessments	Midterm Exam 20% Attendances 10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Introduction to primary health care:** Definition of Primary Health Care (PHC), Goal, Principles, and Strategies.
Session 2 (Week 2)	**Introduction to primary health care:** History of Primary Health Care and objectives of Primary Health Care
Session 3 (Week 3)	**Levels of Health Care:** Primary care level
Session 4 (Week 4)	**Levels of health care:** Secondary care level
Session 5 (Week 5)	**Levels of Health Care:**Tertiary care level
Session 6 (Week 6)	**Principles of Primary Health Care:** Social equity, nation-wide coverage/wider coverage and Self- reliance
Session 7 (Week 7)	**Principles of Primary Health Care:** Inter-sectoral coordination and People's involvement (in planning and implementation of programs)
Session 8 (Week 8)	**What are the Pillars of PHC?:** Community Participation and Inter-sectoral Coordination

Session 9 (Week 9)	**What are the Pillars of PHC?:** Appropriate Technology and Support Mechanism Made Available
Session 10 (Week 10)	Elements/components of PHC
Session 11 (Week 11)	Extended Elements of PHC in 21st Century
Session 12 (Week 12)	Importance and benefits of Primary Health Care
Session 13 (Week 13)	The Challenges for Implementation of PHC
Session 14 (Week 14)	How to overcome the challenges for Implementation of PHC
Session 15 (Week 15)	**Midterm exam**
Session 16 (Week 16)	The Mitigation Measures for Ensuring Effective PHC
Session 17 (Week 17)	MDGs 1: Eradicate extreme poverty and hunger.
Session 18 (Week 18)	MDGs 2: Achieve universal primary education
Session 19 (Week 19)	MDGs 3: Promote gender equality and empower women.
Session 20 (Week 20)	MDGs 4: Reduce child mortality.
Session 21 (Week 21)	MDGs 5: Improve maternal health.
Session 22 (Week 22)	MDGs 6: Combat HIV/AIDS, malaria, and other diseases.
Session 23 (Week 23)	MDGs 7: Ensure environmental sustainability.
Session 24 (Week 24)	MDGs 8: Develop a global partnership for development.
Session 25 (Week 25)	Primary Health Care; Global Targets and Causes of Failure
Session 26 (Week 26)	Primary Health Care institute in Libya
Session 27 (Week 27)	Revision and discussion
Session 28(Week29 - 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of

	changes to students as soon as possible. Timetable may also be revised.

Pharmacology

1	**Course name**	**Pharmacology**
2	**Course Code**	**MT306**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide how a drug affects a biological system and how the body responds to the drug. The discipline encompasses the sources, chemical properties, biological effects and therapeutic uses of drugs.
Textbooks required for this Course:	• Essential of general pharmacology book.Lippincott's Illustrated Reviews: pharmacology book.Pharmacology and drug administration for imaging technology book. • Basic Pharmacology Understanding Drug Actions and Reactions By Maria A. Hernandez,., Appu Rathinavelu, 1st edition 2006. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor. • A Textbook of Clinical Pharmacology and Therapeutics, 5th By James Ritter, Lionel Lewis, Timothy Mant, Albert Ferro 2008 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based.Group interaction and discussion. self-directed activities. Active participation.

Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire new knowledge in pharmacology by conducting and promoting innovative research. • Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs. • Report the clinical applications, side effects of drugs used in medicine. • Translate pharmacological principles into clinical decision making.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	A. General pharmacology: • Introduction. • Drug sources. • Routes of drug administration. • Pharmacokinetics.
Session 2 (Week 2)	A. General pharmacology: • Pharmacodynamics. • Drug adverse effects and toxicity. • Drug-drug interactions.
Session 3 (Week3)	B. Autonomic nervous system: • Introduction. • Sympathomimetics. • Sympathetic depressants.
Session 4 (Week4)	B. Autonomic nervous system: • Parasympathomimetics. • Parasympathetics depressants.
Session 5 (Week5)	B. Autonomic nervous system: • Drug acting on autonomic ganglia. • Skeletal muscle relaxants. • Drug acting on the eye.
Session 6 (Week 6	C. Autacoids: • Histamine & serotonine. • Prostaglandins & eicosanoids. • Vasoactive peptides.
Session7 (Week 7)	D. Central nervous system: • Introduction. • Sedative & hypnotics.
Session8 (Week 8)	D. Central nervous system: • Analgesics and antipyretics & NSAID. • Narcotic analgesics. • Anticonvulsants & antiepileptics
Session9 (Week 9)	D. Central nervous system: • Antiparkinsonian drugs. • Antipsychotics and antianxiety & antidepressants. • Local & general Anaesthetic.
Session10 (Week 10)	E. Cardiovascular system:

	• Antihypertensive & antishock drugs. • Cardiac glycosides and congestive heart failure. • Antiarhythemic drugs. • Drugs used in angina pectoris.
Session 11 (Week 11)	Topics to be covered in the session (week12) F. Blood: 1. Coagulants, anticoagulants, fibrinolytics & antiplatelets. 2. Drugs used in treatment of anemia. 3. Drugs used in treatment of hyperlipidemia.
Session 12(Week 12)	G. Chemotherapy: • Sulphonamides & quinolones. • B-lactum antibiotics (penicilins, cephalosporins).
Session 13 (Week 13)	G. Chemotherapy: • Chloramphenicol & tetracyclines. • Aminoglucosides antibiotics. • Antifungal drugs
Session 14 (Week 14)	**Midterm Exam**
Session 15 (Week 15)	G. Chemotherapy: Antiviral drugs, Antituberculus, Antimalarial drugs & antiprotozal.
Session 16 (Week 16)	H. Endocrie drugs: Antidiabetics drugs and Antithyroid drugs.
Session17 (Week 17)	H. Endocrie drugs: • Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).
Session 18 (Week 18)	H. Endocrie drugs: • Corticosteroids. • Sex hormones, contraceptives drugs.
Session 19 (Week 19)	I. Respiratory system: • Drugs used in treatment of bronchial asthma.
Session 20 (Week 20)	I. Respiratory system: • Cough therapy. * Gas therapy
Session 21(Week 21)	J. GIT: • Drugs used in treatment of peptic ulcer • Antiemetic drugs.
Session22(Week22-23)	J. GIT: • Drugs used in treatment of constipation and diarrhea. • Antispasmodics.
Session23(Week23-28)	K. Urinary tract: 1. Diuretics. 2. Urinary tract infection.
Session24(Week29)	Revision and discussion
Session25(Week 30)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing

	needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Practical Training I

1	**Course name**	**Practical Training- I**
2	**Course Code**	**PH307**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	-----
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students and helps them to understand the practical part of the subjects they have studied and how to link between the theoretical part and practical application on the ground in their filed at laboratories and health institutions
Textbooks required for this Course:	• This course depnd up on practicl training at primary care units, hospitals, primary care clinics and family health centries and other health centres, and vaccination units as well as branches of national centre of deases contron and preventions. Students will be supervised and guided by profetionals • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor, writing report about the lab work.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Practical training, Group interaction and discussion, self-directed activities, Active participation, Laboratory experiments, report writing
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Laboratory procedures and practical application of the material they study during the year. • Principles of diasese control and prevention practically • Work in a team • Write a proffectional report.

	• Under stand and can work at national vaccinations program.
Course Assessments	Weekly Report 20% Attendance and participations 20% Final Assessment and report: 60% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction
Session 2 (Week 2)	Guidance lecture (adherence to all instructions)
Session 3 (Week 3)	Encourage students to fieldwork
Session 4 (Week 4)	• Vital Signs
Session 5 (Week 5)	• Vital signs (young's)
Session 6 (Week 6)	• Vital Signs (adults)
Session 7 (Week 7)	• Vaccination
Session 8 (Week 8)	Vaccination
Session 9 (Week 9)	• Vaccination
Session 10 (Week 10)	Vaccination
Session 11 (Week 11)	Vaccination
Session 12 (Week 12)	Writing reports
Session 13 (Week 13)	Revision
Session 14 (Week 14)	**Midterm exam**
Session 15 (Week 15)	Visit to healthcare unit and writing report on work field
Session 16 (Week 16)	Visit to environmental health unit (if applicable)
Session 17 (Week 17)	Visit to mother and child healthcare units
Session 18 (Week 18)	Discussion of reports
Session 19 (Week 19)	Involving student in research
Session 20 (Week 20)	Strengthening language skills by giving seminars and workshop reports
Session 21 (Week 21)	Seminars
Session 22 (Week 22)	Seminars
Session 23 (Week 23)	Seminars
Session 24 (Week 24)	Revision and discussion

Session 25(Week 25 - 27)	Case report, presentations
Session 26(Week 28)	Revision and discussion
Session 27 (Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Medical Parasitology

1	**Course name**	Medical Parasitology
2	**Course Code**	ML304
3	**Course type:**	**Specialty**
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General Microbiology
7	**Program offered the course**	Public health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course is intended to introduce fundamental and important aspects of the morphology and life cycles of protozoa and helminths causing human disease, in addition to pathological processes caused by these parasites. Special attention is given to life cycle and methods used in collection and examination of specimens used for the diagnosis of parasitic diseases. and to to equip medical technology (mainaly laboratories department) students with the basic concepts of medical Parasitology and general laboratory diagnosis of parasitic diseases of human importance; to provide the students with basic knowledge and understanding of the	

	medically important protozoa and their detection and identification in different clinical specimens.
Textbooks required for this Course:	• Heelan J.S, Ingersoll F.W. Essential of Human Parasitology. Delmar 2002. 2. Cheesbrough M. District Laboratory Practice in Tropical Countries. Part 1, Cambridge 2013. • Debub University. Parasitology for Health Science Students, lecture note series; 2004. • Beaver P.C, et al. Clinical Parasitology. K.M Varghese Company; 12th edition, 2010. • Markell et al. Medical Parasitology. W.B Saunders Company 6th edition 1986. • Brown H. Basic Clinical Parasitology. ACC Norwalk; 5th edition, 1983. • Chiodini P.L. et al. Atlas of Medical Helminthology and Protozoology. Churchill Livingstone, 6th edition; 2008. • Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, active participation, Laboratory experiments, hospital training.
Course Objectives:	By the end of this course the students should be knowledgeable of: • Basic morphology and life cycles of parasites causing human disease. • Specimens to be collected and the methods used for their examination in the diagnosis of parasitic diseases. 3. An understanding of the clinical diseases caused by these parasites • Understand the classification, clinical features, pathogenesis, laboratory diagnosis and prevention and control measures of protozoa. • Basic practical skills of laboratory techniques (specimen collection, processing, examination and reporting) and apply quality assurance in medical parasitology laboratory. • Discuss the concepts of parasitism, the relationships between parasites and host, between parasites and environment and the cultural and socioeconomic factors affecting the transmission of parasites. • Explain the general epidemiological aspects of parasites that affect human • Illustrate the life cycle of specific parasites. • Explain laboratory quality control in parasitology. • List characteristics used to identify protozoa parasites involved in human infections. • Classify parasites having medical significance for human classification of protozoa. • List the most common medically important protozoa. • Describe the prevention and control measures of protozoa. • Compare and contrast the different techniques of protozoa. • Explain laboratory quality control in parasitology.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course.

Content Breakdown	Topics Covering
Session 1 (Week 1)	1. Introduction to Medical Parasitology 1.1 Definition of terms 1.2 Features of parasites 1.3 Source of infection 1.4 Mode of transmission 1.4.1 Direct mode of transmission 1.4.2 Indirect mode of transmission 1.5 Routes of transmission 1.6 Host parasite inter-relationship 1.7 Effect of parasites on the host
Session 2 (Week 2)	1.8 Host susceptibility factors. 1.9 Escape mechanisms of parasites from the immune system 1.10 General life cycle of parasites 1.10.1 Direct life cycle 1.10.2 Indirect life cycle
Session 3 (Week 3)	2. Taxonomy of protozoa 2.1 Quality control of stool examination 3. Different types of amoebae
Session 4 (week4)	**3.1. *Entamoeba histolytica*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.2. *Entamoeba Hertmanni*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.3. *Entamoeba coli*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control Assignment 1 handed out **3.4 *Entamoeba gingivalis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.5 *Iodamoeba butschili*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **3.6 *Entamoeba polecki*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 5 (Week 5)	4. General laboratory diagnosis of parasites 4.1 Types of specimens (urine, blood, stool, sputum, skin.) Assessment • Quiz 1
Session 6 (week 6)	4.2 Collection and preparation of specimen used for parasitological examination 4.3 Preservation of parasites Tutorial for an hour
Session 7 (week7)	4. The Oro-intestinal and Urogenital Flagellates

	4.1 General Characteristics of Intestinal flagellates **4.1.1 *Dientamoeba fragilis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 8 (week 8)	***4.1.2 Chilomastix mesnili*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***4.1.3 Giardia lamblia*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***4.1.4 Trichomonas hominis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis ***4.1.5 Trichomonas vaginalis*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***4.1.6 Trichomonas tenax*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 9(week 9)	5. Introduction of blood and Tissue Flagellates 5.1 General Characteristics Assignment 2 handed out 5.1.1 Leishmaniasis **5.1.2 Leishmania tropica minor** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **5.1.3 Leishmania tropicam major** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **5.1.4 *Leishmania aethiopica*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 10(week10)	***5.1.4 Leishmania donovani*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***5.1.5 Leishmania Mexican complex*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control ***5.1.6 Leishmania braziliensis complex*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control

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الوزير
مكتبة الوحدة الوطنية

Session 11(week 11)	6. Trypanosomiasis **6.1. *Trypanosoma gambiense*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **6.2. *Trypanosoma rhodesiense*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **6.3. *Trypanosoma cruzi*** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 12(week12)	**Midterm Exam**
Session 13 (week13)	**7. Plasmodium spp** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **8. Toxoplasma and Toxoplasmosis** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **9. coccidian (Sporozoa) and ciliated parasites of man** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control. Lab • Examination of persevered specimens and slides and identification of different parasites.
Session 14 (week 14)	**10. Family Culicidae- Mosquitoes** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **11. Family Psychodidae – Sand fly** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control **12. Family Muscidae – House fly, Family Glossinidae** Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control Assessment • Quiz 2
Session 15 (week 15)	• Nematodes : Enterobius, Ascaris, Trichuris, Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 16 (week 16)	Trichinella, Strongyloides, Hookworms Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control

Session 17 (week 17)	Blood and tissue nematodes : Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 18 (week 18)	Microfilaria, Tapeworms : T. solium, T. saginatum. D. latum Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 19 (week 19)	Tapeworm : E. granulosus Cysticercosis Hymenolepis nana Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session20 (week20&21)	Trematodes : Schistosoma, Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session21(week22&23)	Trematodes : Gastrointestinal and pulmonary flukes Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
Session 22 (week 24)	Assessment • Presentation I Tutorial for an hour
Session 23 (week 25)	Direct Wet mount (Saline, blood, Iodine) &Examination and identification of intestinal parasites.
Session 24 (week 26)	General introduction of Laboratory techniques Collection &Preservation of samples.
Session 25 (week 27)	Stool examination, Concentration Techniques, Sedimentation, Flotation
Session 26 (week 28)	Special Techniques, how to write a report,
Session 27(week 29)	Revision (questions answering and discussion).
Session 28(week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج. المقررات الدراسية للسنة الرابعة قسم صحة المجتمع

General Epidemiology

1	**Course name**	**General Epidemiology**
2	**Course Code**	**PH401**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Principle of Epidemiology
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Epidemiological research and provides information that can be used to specify the priority for investigation and action and to identify the importance of a given health problem. And help the students how to identify high-risk groups on which we should focus prevention or apply an appropriate solution. Understanding the natural history of the disease in quantitative terms is important for comparing the effects of possible treatment options or interventions.
Textbooks required for this Course:	• Any textbook of Epidemiology can be used. • David Celentano, Moyses Szklo. Gordis Epidemiology. 6 edition. Elsevier; 2018 • Aschengrau A, Seage GR. Essentials of Epidemiology in Public Health. 4 edition. Burlington, MA: Jones & Bartlett Learning; 2018 • Friis RH, Sellers T. Epidemiology for Public Health Practice. 5 edition. Burlington, Mass: Jones & Bartlett Learning; 2013 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to:

	Understand where the disease is coming from, and who it is most likely to impact. Discover patterns and trends in health problems. Predict the number of cases of a disease and its distribution in the population. Explain the etiology of disease. Study the course of a disease quantitatively from onset to outcome. Assess preventive measures and treatment options. Distinguish the different epidemiological studies.
Course Assessments	Activities 10% Midterm exam 20 % Attendances 10% Final Exam 60% A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Revision of principles of epidemiology (Taken in the third year)
Session 2 (Week 2)	An overview of measurements in Epidemiology
Session 3 (Week 3)	Study designs
Session 4 (Week 4)	Cross-sectional study
Session 5 (Week 5)	Cohort study
Session 6 (Week 6)	Case control study
Session 7 (Week 7)	Training lecture of how to recognize between different study designs. Examples of cross sectional study, cohort and case control study designs.
Session 8 (Week 8)	Experimental studies
Session 9 (Week 9)	Qualitative research Mixed designs Ecological Studies
Session 10 (Week 10)	Qualitative research Space time cluster studies

	Familial aggregation studies
Session 11 (Week 11)	Bias Selection and Information Bias
Session 12 (Week 12)	Confounding
Session 13 (Week 13)	Effect Modification
Session 14 (Week 14)	Causal interference
Session 15 (Week 15)	**Midterm Exam**
Session 16 (Week 16)	Measurement of risks
Session 17 (Week 17)	Causation & association
Session 18 (Week 18)	Outbreak investigations
Session 19 (Week 19)	Fundamentals of research methodology The measurement loop and the Critical Appraisal cube Defining the question/posing the problem Selecting the study design
Session 20 (Week 20)	Fundamentals of research methodology Sample selection Sample size Events, outcome measures, dropouts Analysis and reporting Ethics
Session 21 (Week 21) up to Session 26 (Week 27)	Student presentations (assignments)
Session 27 (Week 28)	Revision and Discussion
Session 28 (Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal

	communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Maternal and child health

1	**Course name**	**Maternal and child health**
2	**Course Code**	**PH402**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Family Health
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course focuses on the study of women during different cycles of their lives including childbearing, child rearing, and menopausal periods. Knowledge of reproductive health, safe motherhood and gynecological aspects are essential for the planning and implementation of care during preconception, conception, antenatal, and postnatal periods. Knowledge from biophysical sciences, humanities and growth and development are essential for the provision of holistic care for women and their families within hospital and community settings. Content also include nonproductive health problems facing women such as family violence, gender issues, and cultural aspects relevant to health of women.
Textbooks required for this Course:	• Kotch's Maternal and Child Health: Problems, Programs, and Policy in Public Health 4th Edition by Russell S. Kirby • Maternal and Child Health: Global Challenges, Programs, and Policies 2009th Edition by John Ehiri • Health organization letters to the House and Senate authors of H.R. 1551/S.1960, the Quality Care for Moms and Babies Act, in support of their introduction of this

	important legislation to address the nation's maternal mortality crisis and the rising number of preterm births • Mattson, S (2010) "Millennium Development Goals and Global Women's and Infants' Health," Journal • of Obstetrics, Gynecology and Neonatal Nursing, 39: 573-579 • World Health Organization. Maternal Mortality Fact Sheet.http: http://www.who.int/mediacentre/factsheets/fs348/en/. • Ahmed, S., Li, Q., Liu, L., Tsui, A. 2012. Maternal Deaths averted by contraceptive use: an analysis of 172 countries. Lancet 380:111-125. • United Nations International Conference on Population and Development. Reproductive rights and reproductive health. Programme of action of the United Nations ICPD. 1994. http://www.unfpa.org/publications/international-conference-population-and-development-programme-action. • United Nations Department of Economic and Social Affairs. 2015. Trends in Contraceptive Use Worldwide. http://www.un.org/en/development/desa/population/publications/pdf/family/trendsContraceptiveUse2015Report.pdf. • Marston, C. 2004. The effects of contraception on obstetric outcome. Geneva: World Health Organization. http://apps.who.int/iris/bitstream/10665/42949/1/9241592257.pdf. • Adapted from http://www.usaid.gov/our_work/global_health/pop/index.html. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: Define legal, cultural, ethical, economic, historical, and political factors which impact the delivery of family centered health care. Describe normal and abnormal physiological and psychological changes that occur during each period of the childbearing cycle and newborn period.

	Discuss the role of the nurse that reflects an understanding of the legal and ethical issues that impact the childbearing family. Use relevant evidence based practice for decision making in relation to childbearing families and the newborn. Synthesize theories and concepts from liberal education to build an understanding of the human experience. Discuss the role of the nurse and the use of nursing standards to monitor patient/family care. Prepare a teaching plan based on principles of teaching/learning. Discuss caring in relation to nursing the childbearing family and newborn. Demonstrate responsibility for growth and development as a learner and a professional. Apply theory related to computer-human interfaces, ethics, confidentiality and privacy, ergonomics and nursing informatics to nursing practice.
Course Assessments	Midterm exam 20% Activities 10% Attendances10% Final Exam 60% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome..
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction to Women and child healthIntroduction to Maternal and Child HealthWhy is maternal and child health important to the field of public health?
Session 2 (Week 2)	Women's life course. The Life Course Perspective/Socio-Economic Determinants of Health
Session 3 (Week 3)	Women's life course, Nutritional needs throughout life
Session 4 (Week 4)	Women's life course, Health needs throughout life
Session 5 (Week 5)	• Reproductive health Reproductive health and health promotion/WHO guidelines
Session 6 (Week 6)	• Infertility and family planning principles
Session 7 (Week 7)	• Maternal mortality Understand Burden of Maternal Mortality

	Causes of Maternal Mortality Understand the "3 delays
Session 8 (Week 8)	Student-led Class Discussion
Session 9 (Week 9)	Conception, fertilization, implantation Embryonic and fetal development, Fetal and Newborn circulation.
Session 10 (Week 10)	Maternal and fetal assessment techniques Physiological and psychological changes in the first, second, and third trimester of pregnancy.
Session 11 (Week 11)	Promoting fetal and maternal health – Maternal and fetal nutrition during pregnancy
Session 12 (Week 12)	Child health Epidemiology of child health globally Interventions to reduce child mortality, promote healthy development, and foster equitable outcomes – historically and today
Session 13 (Week 13)	Screening in child
Session 14 (Week 14)	Health and services for children in school setting
Session 15 (Week 15)	Health and services for children in school setting
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Barker's hypothesis
Session 18 (Week 18)	Adolescent health Dealing with adolescents
Session 19 (Week 19)	Men's health
Session 20 (Week 20)	Determinants of mental health
Session 21 (Week 21-26)	Palliative care in elderly
Session 22(Week 27)	Student presentations (assignments)
Session 23 (Week 28)	Revision and discussion
Session 24 (Week29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all

	aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Environmental Health

1	**Course name**	**Environmental Health**
2	**Course Code**	**PH403**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Public Health
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course covers environmental health topics of importance to the health promotion practitioner. Environment is approached as one of the determinants of health for individuals and human populations.
Textbooks required for this Course:	• Morgan, M.T. (2003). Environmental Health. (3rd ed.). Belmont, CA: Wadsworth/Thomason. • Frumkin, H. ed. Environmental Health from Global to Local, 3nd Edition, Josey Bass (2016) • Handbook of Environmental Health, Two Volume Set • By Herman Koren, Michael S. Bisesi, 4th Edition. • Environmental Health 2nd Edition - February 28, 1980 P. PurdomeBook ISBN: 9780080925318 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: Discuss the history and definition of environmental health. Discuss the association between population growth and dissemination of environmental pollutants. Describe methods used in epidemiology and toxicology to assess environmental exposures and hazards. Describe policies that have been developed to manage health risks associated with exposures to environmental hazards. Identify chemical, physical, and microbial agents that originate in the environment and can impact human health. Describe specific applications of environmental health concepts to fields such as water quality control, food safety, and occupational health.
Course Assessments	Midterm exam 20% Activities 10% Attendances10% Final Exam 60% A 60 % is required for a pass in this course.

Content Breakdown	Topics Coverage
Session 1 (Week 1)	• Introduction to environmental health
Session 2 (Week 2)	Nature of environmental hazards
Session 3 (Week 3)	Risk assessment and risk management
Session 4 (Week 4)	• Chronic and Communicable Diseases
Session 5 (Week 5)	• Water Supplies Public and private supplies
Session 6 (Week 6)	• Environmental Health in Recreational Areas
Session 7 (Week 7)	• Wastewater Management
Session 8 (Week 8)	Solids & Hazardous Waste
Session 9 (Week 9)	Solids & Hazardous Waste Management
Session10(Week10)	Vectors & pest Control
Session11(Week11)	Radiological Health
Session12(Week12)	Air Quality
Session13(Week13)	Food and agriculture
Session14(Week14)	Environmental pollution and control
Session15(Week15)	Environmental disasters and management
Session16(Week16)	**Midterm Exam**
Session17(Week17)	Environmental pollution and control
Session18(Week18)	Human settlement
Session19(Week19)	Student presentations
Session20(Week20)	Review
Session21(Week 21-26)	Human settlement
Session22(Week27)	Student presentations
Session23(Week28)	Review
Session24(Week29)	Final Revision, questions answering and discussion.
Session25(Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.

Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Occupational Health

1	**Course name**	**Occupational health**
2	**Course Code**	**PH404**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is an introduction into the challenging and evolving field of occupational health and safety, and will enable student to gain an understanding of the ethical, legislative, technical, and management aspects of health and safety practice in human resources.
Textbooks required for this Course:	• https://www.pdfdrive.com/occupational-health-and-safety-books.html

	• Fundamentals of occupational safety and health / Mark A. Friend and James P.Kohn.—4th ed.p. cm.ISBN-13: 978-0-86587-171-7 (pbk. : alk. paper) • Definitions,Conversions,and Calculations for Occupational Safety and Health Professionals Third edition. • https://www.pdfdrive.com/definitions-conversions-and-calculations-for-occupational-safety-and-health-professionals-third-edition-definitions-conversions-calculations-for-occupational-safety-health-professionals-e161089440.html • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: Understand the historical, moral, economical and legislative importance of a well-managed health and safety system. Explain technical aspects of safety management including hazard recognition, assessment and control. Understand the fundamental theories of worker protection and how these are applied in the workplace. Discuss how to effectively manage an occupational health and safety program in the workplace.
Course Assessments	Midterm exam 20% Activities 10% Attendances10% Final Exam 60% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and course overview
Session 2 (Week 2)	Hazard Categories and their affects. Hazard Recognition, Assessment and Control.
Session 3 (Week 3)	Physical Hazards.
Session 4 (Week 4)	Chemical, Biological and Ergonomic Hazards.

Session 5 (Week 5)	• Psychosocial Hazards, Workplace Violence & Harassment and Safety Hazards
Session 6 (Week 6)	• occupational toxicology
Session 7 (Week 7)	• Occupational lung disease
Session 8 (Week 8)	• Occupational skin disease
Session 9 (Week 9)	Auditory disorders
Session 10 (Week 10)	Hematology and infection diseases
Session 11 (Week 11)	Mental and neurological disorder
Session 12 (Week 12)	Cardiovascular disorder
Session 13 (Week 13)	Musculoskeletal disease
Session 14 (Week 14)	Reproductive health
Session 15 (Week 15)	Gastrointestinal disorders including liver diseases
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Renal disorder
Session 18 (Week 18)	Occupational cancers
Session 19 (Week 19)	Occupational injuries
Session 20 (Week 20)	Safety Behavior and Organizational Safety Culture.
Session21(Week21-26)	Student presentations and paper work
Session 22 (Week 27)	Gastrointestinal disorders including liver diseases
Session 23(Week 28)	Review
Session 24(Week 29)	Revision and discussion
Session 25(Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing

	basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Nutrition and Public Health

1	**Course name**	**Nutrition and Public Health**
2	**Course Code**	**PH405**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide an introduction to Public Health Nutrition and the role of the Public Health Nutrition professional. Emphasis will be on definition, identification and prevention of nutrition related disease, as well as improving health of a population by improving nutrition. Malnutrition will be discussed on a societal, economic, and environmental level. It will include the basics of nutritional biochemistry as it relates to malnutrition of a community and targeted intervention. Finally, it will review existing programs and policies, including strengths, weaknesses and areas for modification or new interventions
Textbooks required for this Course:	• https://infolearners.com/ebooks/download-public-health-nutrition-textbook-pdf/ • https://fwtrc.gov.in/sites/default/files/Public_Health_Nutrition_2021.pdf • Egan M. Public health nutrition: a historical perspective. J Am Diet Assoc. 1994;94(3):298–304.doi:10.1016/0002-8223(94)90372-7 • Winslow CEA. Th e Evolution and Signifi cance of the Modern Public Health Campaign. New Haven, CT:Yale University Press; 1923. • Centers for Disease Control and Prevention. Th e Public Health System. 2018, June. https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html

	• Institute of Medicine. Th e Future of Public Health. Washington, DC: National Academies Press; 1988. https://www.ncbi.nlm.nih.gov/books/NBK218224 • Michael J, Goldstein M. Reviving the White House Conference on Children. Children's Voice. 2008;17(1). https://www.cwla.org/reviving-the-white-house-conference-on-children • Association of Graduate Programs in Public Health Nutrition. Directory. 2019, October. https://agpphn.org/directory • White House Conference on Food, Nutrition, and Health, 1970. https://academic.oup.com/ • nutrition reviews/article/27/9/247/1875780 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: Identify the determinants for dietary habits and relate these to individual, social, cultural and economic factors Describe the most important public health nutrition problems in high- income and low-income countries respectively, and discuss long term and short term countermeasures Identify and discuss the role and impact of different policy documents, international agreements and regulations of importance for public health nutrition activities on a national and international level Search and compile scientific material in the field of nutritional epidemiology
Course Assessments	Midterm exam 20% Activities 10% Attendances10% Final Exam 60% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to public health nutrition
Session 2 (Week 2)	Factors influencing food selection

Session 3 (Week 3)	Nutrition Policy and Programs
Session 4 (Week 4)	• Dietary Guidelines
Session 5 (Week 5)	Assessment of Nutrition in Individuals and Populations Nutritional Epidemiology Community Needs Assessment
Session 6 (Week 6)	Assessment of Nutrition in Individuals and Populations Dietary Assessment Clinical Assessment Nutrition in Primary Care
Session 7 (Week 7)	Review
Session 8 (Week 8)	Food Availability, Food Safety and food hygiene
Session 9 (Week 9)	Preventive Nutrition
Session 10 (Week 10)	Nutritional needs at community level Children, Special needs, Elderly and Chronic diseases
Session 11 (Week 11)	Community Nutrition and the Lifecycle Nutrition in infancy
Session 12 (Week 12)	Community Nutrition and the Lifecycle Nutrition in childhood
Session 13 (Week 13)	Community Nutrition and the Lifecycle Nutrition in adolescence
Session 14 (Week 14)	Nutrition in Adulthood and Aging Maternal nutrition
Session 15 (Week 15)	**Midterm exam**
Session 16 (Week 16)	Nutrition in Adulthood and Aging Nutrition in Aging
Session 17 (Week 17)	Community Nutrition and Disease
Session 18 (Week 18)	Addressing the obesity pandemic
Session 19 (Week 19)	Community programs in nutrition
Session 20 (Week 20)	Nutrition Intervention
Session 21 (Week 21)	Current issues in nutrition and health (Trans-fat, genetically modified food, nutraceuticals, etc.)

Session 22 (Week 22-25)	Student presentations
Session 23 (Week 27)	Review
Session 24 (Week 28)	Revision and discussion
Session 25 (Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Economics

1	**Course name**	**Health Economics**
2	**Course Code**	**PH406**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course will provide students with a fundamental understanding of the nature of economic theory related to health and health care; this course include: historical trends

	in health care expenditures, an introduction to cost-benefit and cost-effectiveness analysis, economic analysis of the Affordable Care Act,determinants of the demand for medical care, health insurance, and problems in health insurance markets
Textbooks required for this Course:	• Culyer J.A. & J.P. Newhouse (2000) Eds, Handbook of Health Economics: Vols 1A & 1B, Elsivier, North-Holland. • Donaldson Cam and Karen Gerard (1993) Economics of Health Care Financing: The Visible Hand. Macmillan Press Ltd. London. • Folland S., A. Goodman & M. Stano (2010) The Economics of Health & Health Care, Sixth Edition, Prentice Hall, New Jersey. • Jacobs, P. (1991) The Economics of Health and Medical Care Maryland: Aspen Pub Inc. Jack, Williams (1964) Principles of Health Economics for Developing Countries. WBI Development Studies. • The World Bank, Washington D. C. Jones Andrew (2007) Applied Econometrics for Health Economists: A Practical Guide, 2nd Edition • OHE Phelps Charles E. (1992) Health Economics, New York: Harper Collins Pub Inc. • Santerre E. & S.P. Neun (1996) Health Economics: Theories, Insights & Industry Studies, Irwin, Chicago. Zweifel P., F. Breyer & M. Kifmann (2009) Health Economics, Second Edition, Springer Verlag Heidelberg. • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation.
Course Objectives:	Upon completion of this course, the student should have ability to: • Understand the meaning and purpose of health economics. • Know basic instruments of economic analysis of the health sector. • Deail with health as one of the social sectors with economic implication. • Specific nature of the health care service. • Know importance of economics to resource allocation, planning and management of the health sector.

	• Understand the implications of economic development to the health care services and economics of health care financing • Know the importance of health care insurance • Apply economic concepts and techniques to analyze issues in health and health care; • Understand the principles and techniques of economic evaluation of health interventions using the basic principles of epidemiology; • Analyze health systems and health policy issues within the African context;
Course Assessments	Midterm exam 20% Activities 10% Attendances10% Final Exam 60% A 60 % is required for a pass in this course. . Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Health Economics The economic way of thinking about health
Session 2 (Week 2)	Introduction to Health Economics Health measurement, determinants and long run trends
Session 3 (Week 3)	Introduction to Health Economics Health care spending – some facts
Session 4 (Week 4)	Microeconomics in healthcare Basic microeconomic tools
Session 5 (Week 5)	Health care as a commodity
Session 6 (Week 6)	Demand for Health and health care -Demand for health - Demand for health care
Session 7 (Week 7)	Demand for Health and health care -The Grossman model, Socioeconomic disparities in health
Session 8 (Week 8)	Structure and supply of the health care market How providers (physicians, hospitals, medical practices, nursing homes) supply health care services.
Session 9 (Week 9)	Topics to be covered in the session (week)

	Markets and Market Failure in Health and Health Care Goals of health care markets How countries have organized the supply of health care
Session 10 (Week 10)	Markets and Market Failure in Health and Health Care
Session 11 (Week 11)	Different models (Beveridge, Bismark), the role of government, challenges of an aging population.
Session 12 (Week 12)	Health Insurance: Introduction and Moral Hazard
Session 13 (Week 13)	Health Insurance: Adverse Selection in Health Insurance
Session 14 (Week 14)	Health Insurance ,Market for health insurance and managed care
Session 15 (Week 15)	Measurement of health benefits
Session 16 (Week 16)	Economic Evaluation in health
Session 17 (Week 17)	defining and measuring the value of innovations and the value of medical spending.
Session 18 (Week 18)	**Midterm Exam**
Session 19 (Week 19)	Disease and facility based on cost analysis
Session 20 (Week 20)	Equality, equity and social justice
Session 21 (Week 21)	Financing of health care
Session 22 (Week 22)	Health Policy and Reforms
Session 23 (Week 23)	The Role of Government in Health Care
Session 24(Week 24-26)	Student presentations
Session 25(Week 27-28)	Review ,Revision and discussion
Session 26(Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.

Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Promotion

1	**Course name**	**Health Promotion**
2	**Course Code**	**PH407**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Public Health Proog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding and provide them with knowledge and skills in health promotion work and ability to be able to contribute to a sustainable development by working health promotion and preventive on individual group and community level in the different arenas man is in
Textbooks required for this Course:	• Foundations for Health Promotion, 4th Edition by Jane Wills & Jennie Naidoo 2016 https://www.mea.elsevierhealth.com/foundations-for-health-promotion-9780702054426.html?nosto=nosto-page-category1 • Foundations for Health Promotion, 5th Edition by Jane Wills 2022 https://www.mea.elsevierhealth.com/foundations-for-health-promotion-9780702085062.html?nosto=nosto-page-category1 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours

Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	On completion of the course, the student should be: • Able to reflect on health and the unequal distribution of the health in a population perspective independently as well as be able to describe the importance of the structure of the society/organization for the condition and distribution of the health • Independently be able to reflect on important concepts and strategies for a health promotion work and evidence-based work directed to individuals/groups/populations and be able to state possibilities and limitations of different strategies are observed there inter alia health economics considerations • Able to explain the relationships between working environment independently physical activity, stress/well-being and different aspects on health from a group and population perspective • Independently based on a needs analysis be able to apply and use evidence-based methods, recommendations and guidelines with respect to working environment, physical activity and stress/well-being for different groups in society • Able to apply independently measure and evaluation methods at health promotion work above all methods with a focus on working environment, physical activity and stress/well-being • In groups structured be able to develop a plan for a thought health promotion projects and be able to justify and debate choice of target group, planning, implementation and evaluation of the project independently • knowledgeable about various health promotion programs while learning how to plan, implement, and evaluate them. Retain a meaningful understanding of health promotion programs. • Develop, implement, and evaluate several programs during the semester. • Be familiar with various methods of teaching and implementing different health promotion programs.

	• Identify premiere health promotion programs in the students' communities and nationwide. • Identify specific periodicals and resource books specifically related to developing health promotion programs. • Identify resources available related to health promotion.
Course Assessments	Final Exam 60 % Midterm Exam 20 % Activities 20 % Attendances 10% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Course Overview
Session 2 (Week 2)	Concepts of Health, Health Promotion, and Illness Prevention Epidemiology
Session 3 (Week 3)	Complementary, Alternative & Integrative Health
Session 4 (Week 4)	History of Health Promotion
Session 5 (Week 5)	Health Promotion Theories
Session 6 (Week 6)	Health risk assessment
Session 7 (Week 7)	Revision
Session 8 (Week 8)	Strategies for Health Promotion
Session 9 (Week 9)	Validity & Reliability of Diagnostic & Screening Tests
Session 10 (Week 10)	Natural History of Disease
Session 11 (Week 11)	Genetic & Social Determinants of Health
Session 12 (Week 12)	Health Literacy
Session 13 (Week 13)	Health Promotion in Diverse Populations
Session 14 (Week 14)	Evaluation, Research & Measurement in Health Promotion
Session 15 (Week 15)	Health Promotion Policy
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Rural Health Promotion
Session 18 (Week 18)	The Ottawa Charter
Session 19 (Week 19)	Educational and Community-Based Programs for health promotion
Session 20 (Week 20)	Health promotion and community engagement
Session 21 (Week 21)	Health promotion examples and Health promotion in schools
Session 22 (Week 22)	Health promotion examples Health promotion among adolescents

Session23(Week23-26)	Students' activities and presentations
Session24(Week27-28)	Review, revision and discussion
Session25(Week29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Practical Training II

1	**Course name**	**Practical Training- II**
2	**Course Code**	**PH408**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	6 Hours per week
6	**Pre-requisite requirements**	Practical Training- I
7	**Program offered the course**	Public Health Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		The Course is continuity to Training Practical I. The course is designed to provide opportunities by which the students develop a level of integration between theoretical knowledge and practical skills and techniques of actual patients within the hospital department and other health institutions .

Textbooks required for this Course:	This course is a training and practical application under the supervision of teaching assistants in the department and specialists in hospitals and health centers to help students to be will trained and able to integrate between theoretical knowledge and practical skills and techniques.
Course Duration	6 * 28 = 168 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Refine the practical skills of students through clinical training in the hospital. • Develop technical skills in his filed. • Acquire patient care skills and methods of protection from the dangers. • Begin applying the acquired knowledge and skills clinically. • Do Practical Demonstrations in different public hesth aerias. • Collaborate and work effectively with a team. • Make a dicision and solove problems proberly.
Course Assessments	Practice Assessment 70 % Practice Record Book 20% Activities 5 % Attendances 5 %
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Knowledge and Understanding
Session 2 (Week 2)	Qualify the student to participate in the inspection teams and health control and assist in laboratory investigation of the samples checked and their conformity with medical conditions
Session 3 (Week 3)	Enable the student to medical devices used and cared for and machines used in diagnosis and treatment
Session 4 (Week 4)	Enable the student to work in the field of occupational health and safety
Session 5 (Week 5)	Enable the student to learn and participate in special surveys teams transitional diseases and how to control it.
Session 6 (Week 6)	Health awareness campaigns
Session 7 (Week 7)	Enable the student to learn how to implement primary health care programs
Session 8 (Week 8)	Enable the student to assist the doctor in nursing and therapeutic and diagnostic procedures during implementation of health programmers

Session 9 (Week 9)	Discussion of reports
Session 10 (Week 10)	Subject-specific skills
Session 11 (Week 11)	Enable the student to carry out primary health care programs
Session 12 (Week 12)	Enable the student to work in teams of special surveys with infectious diseases and how to control it
Session 13 (Week 13)	Enable the student to participate in occupational safety and health field
Session 14 (Week 14)	**Midterm exam**
Session 15 (Week 15)	Thinking skills
Session 16 (Week 16)	Analysis of some health institutions by leveraging data for diseases
Session 17 (Week 17)	Implementation of primary health care programmers
Session 18 (Week 18)	Eligibility to work in the inspection teams and health control and assist in laboratory investigation of the samples checked and their conformity with medical conditions
Session 19 (Week 19)	Participate in special surveys teams transitional diseases and how to control it
Session 20 (Week 20)	General and Transferable Skills (other skills relevant to employability and personal development)
Session 21(Week 21 - 22)	Student participation with governmental institutions/hospitals and health centers
Session 23 (Week 23)	Train students to do field research projects
Session 24 (Week 24)	Conducting seminars and and invite students to attend
Session 25 (Week 25)	Student conferences
Session 26 (Week 26 - 27)	Reports discussion
Session 27(Week 28)	Revision and discussion
Session 28 (Week 29- 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal

	communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

تاسعا: قسم تقنية الأغذية

أ. المقررات الدراسية للسنة الثانية قسم تقنية الأغذية

Food Chemistry

1	**Course name**	**Food Chemistry**
2	**Course Code**	**NT201**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3 units
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of food chemistry. Content: Description of chemical and biochemical properties and function of components in food: Carbohydrates, proteins, lipids, water, colors, aroma compounds, vitamins and minerals. Chemical composition, structure, biochemistry and quality of important foods
Textbooks required for this Course:	• Food Chemistry textbook, by Hans-Dieter Belitz, Werner Grosch and Peter Schieberle 4th Edition 2009 • Food Chemistry, Third Edition (Food Science and Technology Series , No 76) 3rd Edition by Owen R. Fennema 1996 • Introduction to Food Chemistry by Richard Owusu-Apenten 1st edition 2004 • The Chemistry of Food by Jan Velisek 2nd edition 2013 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Explain properties and reactions of carbohydrates, lipids and proteins during storage and processing of food and how these influence the quality and properties of the food.

	Explain the importance of water for stability and quality of foods. • Give an overview of the main classes of compounds influencing colour and flavor of food and have knowledge on important sources of vitamins and minerals in food and how these affect other quality aspects of food. • Give an account of necessary growth conditions for important pathogens in food and precautions to avoid food infections and food poisoning. • Give an account of sources of important classes of undesirables in food and the HACCP term. • Be able to explain processes taking place during storage of muscle tissue and how these affect qualities. Have knowledge on different methods in sensory analysis and understand possibilities and limitation of the different methods. • Have knowledge on and be able to use food regulations. • Can read and understand relevant literature on a selected topic and present it in the form of a poster. • Can present and explain results achieved in the lab. • Can work independently and in groups
Course Assessments	Final Exam 60 % Midterm Exam 20 % Activities 20 % Attendances 10% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Food Chemistry
Session 2 (Week 2-3)	Water: Definition of water in food, Structure of water and ice, Types
Session 3 (Week 4- 7)	Lipids: Classification of lipids, Physical and chemical properties
Session 4 (Week 8 - 11)	Proteins: Protein classification and structure and Functional properties.
Session 5 (Week 12 - 15)	Carbohydrates: Classification , changes during cooking and processing
Session 6 (Week 16)	**Midterm Exam**
Session 7 (Week 17- 20)	Food pigments and vitamins and minerals
Session 8 (Week 21 - 24)	Flavors: Definition and basic taste
Session 9 (Week 25 - 26)	Food additives : classification
Session 10 (Week 27 - 28)	introduction to Food laboratory devices

Session 11 (Week 29)	Revisions and discussion
Session 12(Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Analytical Chemistry

1	**Course name**	**Analytical Chemistry**
2	**Course Code**	MT302
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	Get an introduction to analytical chemistry and its applications in clinical settings. Students will learn basic principles of analytical chemistry and will explore a wide range of common techniques and methods used in modern analytical laboratories, including HPLC, mass spectrometry, spectroscopic and immunochemical techniques. Other topics include interpretation of analytical data and evaluation of error and uncertainty in measurements. The final part of this course focuses on applications of analytical chemistry in clinical and laboratory settings.	

Textbooks required for this Course:	• Modern Analytical Chemistry by David Harvey 2009 • Textbook of Analytical Chemistry by Harsh Malhotra 2011 ISBN-13978-8184113143 • Analytical Chemistry, 7th Edition by Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug ISBN: 978-1-118-80516-9, 2013 • Christian, Gary D., Analytical Chemistry, 5th ed., John Wiley & Sons, New York,1994. • Day, R. A. and Arthur L. Underwood, Quantitative Analysis, 6th ed., Prentice Hall,Upper Saddle River, NJ, 1991. • Ewing, Galen Wood, Ed., Analytical Instrumentation Handbook, 2nd ed, Marcel Dekker, New York, 1997. • Gill, Robin, Ed., Modern Analytical Geochemistry: An Introduction to Quantitative Chemical Analysis Techniques for Earth, Environmental and Materials Scientists, • Addison Wesley, Harlow, U.K., 1997. • Harris, Daniel C., Quantitative Chemical Analysis, 5th ed., W. H. Freeman & Co,.New York, 1998. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor أساسيات الكيمياء التحليلية د. عاطف نصار
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: •Understand basic principles of analytical chemistry and various analytical techniques •Explore a range of instrumental methods of analysis, including mass spectrometry, as well as spectroscopic, chromatographic, and immunochemical methods •Be able to interpret analytical data and evaluate error and uncertainty in measurements •Understand the analyst's role and analytical chemistry applications in the clinical setting
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1&2)	• Introduction to analytical chemistry
Session 2 (Week 3&4)	• Basic tools of analytical chemistry
Session 3 (Week 5)	• Concentration expression
Session 4 (Week 6&7)	Weight percentage and volume percentage
Session 5 (Week 8&9)	• Molality and mole fraction
Session 6 (Week 10)	• Molarity and Normality concentration
Session 7 (Week 11&12)	• Methods of expression substance quantity
Session 8 (Week 13)	**Midterm Exam**
Session 9 (Week 14)	• Equivalent weight of compounds
Session 10 (Week 15)	• Stoichiometric calculations
Session 11 (Week 16)	• Parts per thousand (ppt)
Session 12 (Week 17)	• Parts per million (ppm)

Session 13 (Week 18)	• Parts per billion (ppb)
Session 14 (Week 19&20)	• Dilution calculation of solution
Session 15 (Week 21&22)	• Measure of acidity (pH)
Session 16(Week 23&24)	• Collecting and Preparing Samples
Session 17(Week 25)	• Gravimetric Methods
Session 18(Week 26)	• Titrimetric methods
Session 19(Week 27&28)	• Equilibrium chemistry
Session 20 (week 29)	Revision and discussion
Session 20 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Principles of Food Safety and Quality

1	**Course name**	**Principles of Food Safety and Quality**
2	**Course Code**	**NT204**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will introduce the biological and chemical hazard in food that result from improper processing, packaging, handling and storage; cleaning of food plant equipment and facilities including characteristics of soil on equipment surfaces, cleaning compounds, clean in place, clean out of place, sanitizers and their characteristics, GMPs, HACCP, food composition of certain hazardous food, commodities storing , food quality and deterioration, food intoxication, food poisoning and all food borne illness.
Textbooks required for this Course:	• Encyclopedia of Food Safety by Yasmine Motarjemi (2013) • Food Quality AssurancePrinciples and Practices By Inteaz Alli 1st Edition 2003, eBook ISBN 9780429204739 • SETHI, M. 2008. Institutional Food Management. New Age Publishers.New Delhi. • https://www.taylorfrancis.com/books/mono/10.1201/9780203484883/food-quality-assurance-inteaz-alli • https://ncert.nic.in/textbook/pdf/lehe106.pdff=false • Principles of Food Sanitation 5th edition 2006 DOI https://doi.org/10.1007/b106753 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.

Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Explain various types of food contamination and factors that contribute to foodborne illness • Identify the characteristics of potentially hazardous foods • Describe the dangers of foodborne illness • Identify the high risk population • Demonstrate the ability to explore and apply proper food handling techniques that will eliminate possible foodborne illness. • Demonstrate correct procedures for receiving, preparing, serving and storing food products • Identify food handler health problems that are a possible threat to food safety • Demonstrate proper personal hygiene procedures with regard to food handling • Demonstrate the ability to discuss the importance of food safety training in the workplace. • Now how to conduct ISO, GMP, HACCP and other mentoring system and quality control.
Course Assessments	Activities 10% Midterm exam20% Attendances 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1 - 2)	Introduction to Food Safety
Session 2 (Week 3 - 9)	Food Safety Hazards
Session 3 (Week 10 - 17)	General Principles of Food Hygiene
Session 4 (Week 18)	**Midterm Exam**
Session 4 (Week 19 to 23)	Hazard Analysis and Critical Control Point (HACCP)
Session 5 (Week 24 - 25)	Practical Activities
Session 6 (Week 27-27)	Students presentations
Session 6 (Week 28)	Revision and discussion
Session 7 (Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until

	class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Human Anatomy

1	**Course name**	**Human Anatomy**
2	**Course Code**	**MT201**
3	**Course type: /general/specialty/optional**	general
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the systems of the human body. Necessary life functions and survival needs will be examined, followed by an orientation of the language of anatomy. Students will learn the terminology, anatomy of each body system. Thorough analyses of tissue types, the integumentary system, skeletal tissue and the human skeleton, joints, muscle tissue and the muscular system, the fundamentals of nervous tissue, the nervous system, the study of blood, cardiovascular system including lymphatic system, immune system, respiratory system, digestive system, urinary system and male and female reproductive systems. Emphasis is placed on the integration of systems as they relate to normal health.
Textbooks required for this Course:	• Essentials of Human Anatomy & Physiology by Elaine Marieb10th Edition or later (recommended).

	• Human Anatomy & Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn. • Introduction to the Human Body, 10th Edition • Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability: • Define the anatomic terms used to refer to the body in terms of directions and geometric planes and describe the structure and function of various human organs and systems; • Describe the major cavities of the body and the organs they contain. • Explain what a cell is? and explain how human organs and systems interact. • Describe the major functions of the four types of human tissue. • List the major systems of the body, the organs they contain and the functions of those systems. • Define the terms anatomy and physiology. • Define homeostasis. • Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• Introduction to Anatomy • Levels of organization • Body regions, planes, and orientations and body cavities
Session 2 (Week 3-4)	• Skeletal system • Bone structure and types, cartilage, ligaments, tendons, and joints • Axial and appendicular skeletons • Scientific terminologies of the main body bones
Session 3 (Week 5-6)	• Muscular system • Types of muscles, Differences and their microscopic structure • Skeletal muscle structure and neuromuscular junction • Scientific terminologies of the main body Muscles
Session 4 (Week 7-9)	• Cardiovascular (Circulatory) system • Components of cardiovascular system and types of circulations • The heart, arteries, veins, capillaries, and lymphatic vessels • The blood components (plasma and blood cells • Scientific terminologies of the main cardiovascular components
Session 5 (Week 10-11)	• Respiratory system

	• Upper respiratory system (nose, pharynx, larynx, and trachea) • Lower respiratory system (Lungs, thoracic cage, and pleura) • Bronchi, bronchioles, alveoli and respiratory membrane • Respiratory muscles and lung volumes and capacities • Scientific terminologies of the main respiratory system parts
Session 6 (Week 12-14)	• Digestive system • Upper digestive system (mouth, pharynx, and esophagus) • Lower digestive system (stomach, small intestine, and large intestine) • Structure of digestive system walls • Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder) • Scientific terminologies of the main Digestive system parts
Session 7 (Week 15)	**Midterm Exam**
Session 8(Week 16-17)	• Integumentary system • Skin structure and types • Skin layers and skin color • Receptors and glands • Skin burns and disorders • Scientific terminologies of the main skin structures
Session 9 (Week 18-19)	• Urinary system • The main parts of the urinary system • Kidney structure • Nephron and Glomerulus • Types of blood vessels in the kidney • Uterus, bladder and urethra • Scientific terminologies of the main urinary system parts
Session 10 (Week 20-22)	• Endocrine system • Endocrine glans names and locations • Structure, location, and hormones of hypothalamus and pituitary gland • Structure, location, and hormones of thyroid and parathyroid glands • Structure, location, and hormones of pineal and thymus glands • Structure, location, and hormones of pancreas and adrenal glands • Structure, location, and hormones of the ovaries and testicles gland • Structure, location, and hormones of other glandular structures • Scientific terminologies of the main endocrine glands
Session 11 (Week 23-24)	• Reproductive system • Reproductive systems of male and female • Structure and hormones of the ovaries and testes • Production of the sperms and ova • Scientific terminologies of the main parts of reproductive system parts
Session 12 (Week 25-26)	• Central Nervous system • brain, spinal cord, & peripheral nerves • Neurons (types and structure) • Neurotransmitters and synapses • Scientific terminologies of the main parts of the central nervous system parts

Session 13 (Week 27-28)	• Autonomic Nervous system • Sympathetic and parasympathetic autonomic nervous system • Preganglionic and postganglionic neorons • Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system • Scientific terminologies of the main parts of the autonomic nervous system parts
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Biochemistry

1	**Course name**	Biochemistry
2	**Course Code**	MT202
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Chemistry
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course explores the basic principles of biochemistry and develops the student's appreciation and understanding of biological networks. including proteins, enzymes, carbohydrates, lipids and nucleic acids in relationship to biological and metabolic processes.
Textbooks required for this Course:	• Lippincott's Illustrated Reviews: Biochemistry.ISBN-13: 978-1496344496ISBN-10: 1496344499. • Harper's Illustrated Biochemistry.ISBN-13: 978-1259837937. ISBN-10: 1259837939. • Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148. • Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840. • Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586. • Additional textbooks and web links may be used in this course at the discretion of the instructor. • http://www.kume.edu/biochemistry/resource.html
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis. • The metabolism and the metabolic control of dietary and endogenous carbohydrate, lipid, protein and nucleotides; and how the DNA in a genome is organized, replicated, and repaired and how the genetic information in the DNA is selectively expressed as functional proteins and RNA and how this expression is regulated. • The tools used in biochemistry, and their potential applications to medical technology science.

	• The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals. • Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body. • Identify and explain the structure and functions of each body system.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction and definition of biochemistry
Session 2 (Week 2)	Biochemistry of the cell
Session 3 (Week 3&4)	• Body fluids of the cell
Session 4 (Week 5 & 6)	• biochemistry of the cell
Session 5(Week 7,8)	• Chemistry of Carbohydrate
Session6(Week 9)	• Nucleotide
Session 7(Week 10)	• Nucleic acid
Session 8(Week 11)	• Chemistry of Lipids
Session9(Week 12)	**Midterm Exam**
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	**Midterm practical exam**
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyries
Session14(Week 18 & 19)	Hemoglobin
Session15(Week 20)	•Vitamins
Session16(Week 21)	Revision of lecture
Session17(Week22 & 23)	•Carbohydrate Metabolism
Session18(Week 24 & 25)	•Lipid metabolism
Session19(Week 26,27)	•Protein Chemistry and Metabolism
Session20(Week 28)	Revision of lecture
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

General Microbiology

1	**Course name**	General Microbiology
2	**Course Code**	MT203
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The course enables students to know: * The microorganism and definition of all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells. *Methods and types sterilization and disinfectant. * Culturing and cultivation of Microorganisms and basic way of their identifications
Textbooks required for this Course:	• Text book of microbiology First Published in 2010 by Prem C. Bakliwal forAavishkar Publishers ISBN 978-81-7910-306-7. • https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf • https://open.umn.edu/opentextbooks/textbooks/873 • https://www.britannica.com/science/microbiology • https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/1%3A_Introduction_to_Microbiology • https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells. • Comprehend the fundamentals of molecular microbiology. • Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.

	• Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health. • Understand Microbial Cell Structure, Function and methabolism.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction, of microbiology
Session 2 (Week 2)	History of Microbiology
Session 2 (Week 3)	Defining Microbes and Basic concepts and scope of microbiology
Session 3 (Week 4)	Pasteur and spontaneous Generation
Session 4 (Week 5 & 6)	Types of microorganisms
Session 5(Week 7,8)	Classification of microorganisms
Session6(Week 9)	Immunization, antiseptics and antibiotics
Session 7(Week 10)	Microscopy
Session 8(Week 11)	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
Session9(Week 12)	Bacterial structure& composition
Session10(Week 13)	Bacterial Genetics
Session11(Week 14 & 15)	Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
Session12(Week 16)	**Midterm exam**
Session13(Week 17)	Isolation and culturing of Bacteria
Session14(Week 18 & 19)	Microbial metabolism
Session15(Week 20)	Classification of bactria
Session16(Week 21)	Dyes and staining (gram stain, acid fast staining, and other staining metods).
Session17(Week22 & 23)	Fungi: 1. what is mycology? 2. Classification and structure 3. Moulds, yeasts and dimorphic fungus. Fungal diseases Algae: 4. Characteristics, structure and division of algae
Session18(Week 24 & 25,26)	Viruses 1. Definition, Characteristics, symmetry and structure of viruses, 2. Classification and growth of Viruses. 3. Detection, multiplication of Viruses. 4. Laboratory methods used for viral detection
Session19(Week 27,28)	Parasites 1. Definition, Characteristics and structure of parasites, 2. Summary of Parasitic Classification (Protozoa and Helminths). 3. Detection, multiplication of Protozoa and Helminths. 4. Laboratory methods used for viral detection
Session21 (Week 29)	**Final practical Exam**
Session22 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed.

	Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Histology

1	**Course name**	Histology
2	**Course Code**	MT204
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Medical Laboratories Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of Histology and Know the different types of tissues of the body Recognize the function performed by each tissue Learn about common terms and definitions used in histology
Textbooks required for this Course:	• DiFiore's atlasof histologywith functionalcorrelations. Junqueira'sBasic Histology. • Histology: An Essential Textbook by D. J. Lowrie Jr 2020 • Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021 • Textbook of Histology by Leslie P. Gartner PhD 2021 • Histology: A Text and Atlas 7th edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015 • Wheater's Functional Histology: A Text and Colour Atlas 3rd edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaaching hours
Delivery	Lecture-based. Group interaction and discussion.

	self-directed activities. active participation. Laboratory experiments.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Acquire a basic background in histology and comparative histology in different and to understand the properties of cells and their interactions with one another as components of tissues and organs. • Understand how structure and function correlate at the microscopic level and be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination. • Understandthe changes that occur to tissues • Identify the different types of tissues • Recognize the types of tissues and the mechanisms of identifying them • understand the various diagnostic tools and medical equipment in the correct way to discover histological changes • Understand how to distinguish tissue and how it develops • deduce the causes of the changes that have occurred within the tissues
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to histology histology and its mode of study
Session 2 (Week 2)	The cell
Session 3 (Week 3)	Epithelial Tissue
Session 4 (Week 4)	Connective tissue
Session 5 (Week 5)	Cartilage
Session 6 (Week 6)	Bone
Session 7 (Week 7)	Bone.
Session 8 (Week 8)	Muscle Tissue
Session 9 (Week 9)	Nerve Tissue
Session 10 (Week 10)	Nervous System
Session 11 (Week 11)	The Immune System &
Session 12(Week 12)	Lymphoid Organs
Session 13(Week 13	Blood and Hemopoiesis
Session 14 (Week 14)	Endocrine System
Session 15(Week 15)	Hormones
Session 16(Week 16)	The integumentary system
Session 17 (Week 17)	The Circulatory system
Session 18 (Week 18)	The Circulatory system
Session 19 (Week 19)	The Circulatory system
Session 20 (Week 20)	• Respiratory system
Session 21 (Week 21)	Respiratory system
Session 22 (Week 22)	Respiratory system
Session 23 (Week 23)	Digestive system

Session 24 (Week 24)	The urinary system
Session 25 (Week 25)	The urinary system
Session26(Week26- 27)	Reproductive system
Session 28 (Week 28)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team Ability to perform tasks in accordance with ethical and professional principles. The student should be able to write a report on the histological conditions. The student should be able to think critically to solve problems and make decisions.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Physiology

1	**Course name**	Physiology
2	**Course Code**	MT205
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	non
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Medical Laboratories
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Physiology is studying of biological function. medical physiology course will study human function at the level of whole organisms, tissues, cells and molecules (Study of human body function). Physiology is fundamental to medicine and studying function in both health and disease. (Content : Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)
Textbooks required for this Course:	• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1 • Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12th ed.ISBN 978-0-470-08471-7 • Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2 • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,
Course Duration	4 * 28 = 112 teaching hours
Delivery	Interactive Lecturer introduces of common clinical conditions and explains the underlying phenomena through questions, pictures and videos and students are actively involved in the learning process, and Students' take responsibilities of their own learning through selfstudy, sharing and discussing with peers, search information from Learning Resource Center of teachers and resource persons within and outside the college. Students can utilize the time within Laboratory hours.
Course Objectives:	The primary objective of the course is to ensure that students understand how the body works and after completing this course student should be able to: • Have sufficient basic knowledge in medical physiology. • Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu. • State the functions of each organ system of the body, explain the mechanisms by which each functions, and

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	relate the functions and the anatomy and histology of each organ system. • Understand and demonstrate the interrelations of the organ systems to each other. • Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses. • Explain the pathophysiology of common diseases related to the organ systems of the body • The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body. • Ability to use basic laboratory devices related to the subject and have the ability of measuring and evaluating vital variables (blood pressure, pulse, ECG, nerve conduction velocity, basic pulmonary function tests) of the normal functions of the body in the laboratory.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction, Autonomic nervous system, Blood, Nerve& muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine) ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the year▪ ▪Inform students how student learning program of the year-wise has been organized Help students organize and manage their studies throughout the yea ▪ Guide students on assessment methods, rules and regulations ●Introduction (Total body water , cell membrane and cell transport)
Session 2 (Week 2)	Autonomic Nervous System ●Types Autonomic Nervous System • Chemical neurotransmitters ●Function of sympathetic &Parasympathetic Assignment 2 handed out
Session 3 (Week 3)	The blood: • Major components and function of the blood • Red & white blood cells • Plasma protein and function
Session 4 (Week 4)	• Blood groups & hemostasis Blood clotting disorders
Session 5 (Week 5)	Nerve & Muscle •Structure of nerve cell •Properties of neuron •Resting membrane potential
Session 6(Week 6)	Nerve & Muscle

	• Action potential •Excitation- contraction coupling • Mechanism of muscle contraction & relaxation
Session7(Week 7)	Cardiovascular system • Anatomy of the heart • Functional properties of cardiac muscle •Action potential & Conducting System
Session 8(Week 8)	•Cardiac Cycle & Heart sound •Electrocardiograph
Session 9(Week 9)	• Blood pressure •Cardio dynamic •Arrhythmia & circulatory Shock
Session10(Week 10)	•Arrhythmia •circulatory Shock
Session11(Week 11)	Respiratory System • Structure of the respiratory system • Lung volume & Capacities
Session12(Week 12)	•Oxygen & Carbon Dioxide in blood •Dissociation oxygen curve shift
Session13(Week 13)	•Transport carbon dioxide •Regulation of respiratory • Hypoxia
Session14(Week 14)	Nervous System •Division of the nervous system •Units of Nervous system •Types of Receptors
Session15(Week 15)	**Mid exam**
Session15(Week 16)	Nervous System:•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter
Session16(Week 17)	•Somatic sensation •TypesSomatic sensation • Pain sensation •Pathways
Session17(Week 18)	•Referred Pain •Pain Control System
Session18(Week19)	Special senses •Vision •Hearing
Session19(Week 20)	•Special senses •Gustation •Olfaction
Session20(Week 21)	Gastrointestinal tract •characteristics of gastrointestinal wall •Explain functional types of movements in GIT •Control of GIT
Session21(Week 22)	•GIT hormones and their role in digestive process •Describe GIT reflexes •Mastication and salivary secretions
Session22 (Week 23)	•Describe motor functions of stomach •Explain regulation of stomach emptying &the composition, function and •regulation of gastric secretions •Vomiting reflex

Session23 (Week 24)	•Gall bladder and biliary tract •intestinal motility •Defecation reflex
Session25 (Week 25,26)	Urinary system •The kidney •Urine formation •Micturition •Renal failure •Male reproductive •Female reproductive
Session26 (Week 27,28)	Endocrine System Pituitary gland Thyroid gland Parathyriod Adernal gland Endocrine cell in other organs
Session27 (Week 29)	**Final Exam**
Attendance Expectations	Students must attend each of lecture, arriving on time, . Absences are permitted only for medical reasons and must be supported with a doctor's note. Because collage bylaw do not allow student to absences for more than 25%
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses. Numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised..

Medical Psychology & Teaching Methodology

1	**Course name**	Medical psychology& Teaching Methodology
2	**Course Code**	**MT206**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Fisrt part of this course will provide students with a fundamental understanding of medical Psychology, a subfield of behavioral medicine, is the study of psychological factors important in the promotion and maintenance of health and the psychological factors contributing to illness and disease. It is designed to apply a scientific and research perspective to the study of health promoting and health damaging behaviors. Modification of health-related behaviors will be explored. Second part of the course will cover different teaching methods and techniques.
Textbooks required for this Course:	• Textbook of Medical Psychology Hardcover – January 1, 1961 • https://bookauthority.org/books/best-medical-psychology-books • https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4 • Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001. • Armstrong, Thomas. Multiple Intelligences in the Classroom: 2nd Edition. Association for Supervision and Curriculum Development, 2000. • Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997. • Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003. • Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002. • Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.

	• Teaching Techniques for Church Education. Evangelical Training Association, 1983. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Up on completion of this course students will be able to: • Understand the principle domains of psychology that are most relevant to medicine. • Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings. • Be famillar with the application of psychology in the wider practice of medicine. • understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses. • Will be able to define and list the fruits of the spirit. • The student will be able to explain why the fruit of the spirit are important to believers. • The student will be able to assess which fruits are most and least evident in their own lives. • The student will develop a plan to practice more of the fruit of the spirit for the next week • Undestand the basics of theching methods • Know different techniques of teching and questions preparations.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	An introduction to Medical psychology
Session 2 (Week 2)	Psychology and Medicine • Explain what the field of Psychology studies. • Describe the different areas of Psychology. • Describe the way by which Psychology is linked to Medicine.
Session 3 (Week3-4)	Brain Mechanisms and Behaviour • Describe the basics of Neural Communication. • Explain the Basic Structure and function of the Nervous system. • Outline the link between biology and behavior.
Session 4 (Week 5)	Senses and Integration on Senses • Describe the role and the importance of the different types of senses. • Outline the main functional theories of vision. • Outline the main functional theories of audition. • Outline the main theories of somatosensation. • Outline the main theories of the functions of smell

Session5 (Week 6)	• Perception, attention and Memory • Outline the role of the different types of perception. • Describe the main theories of visual perception. • Describe the main theories of auditory perception. • Outline the main types of attention. • Describe the main theories of attention. • Outline the main types of memory. • Describe the main theories of memory
Session 6 (Week 7)	Child Development (from birth to adolescence) • Describe the different stages of development from birth to adolescence. • Outline the main theories of child development. • Outline the main theories of early stages of language acquisition. • Describe the main theories of language development. • Outline the theories connecting language and cognition. • Language and the brain.
Session 7(Week 8)	Language, Motivation and Emotions Individual Differences in Intelligence and Personality • Outline the area of Motivation. • Outline the way by which motivation is link with emotion. • Outline the main theories of Emotions. • Describe the biological theories of emotions. • Describe the psychological theories of emotions. • Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools. • Outline the main Psychometric tools and their role in diagnosis. • Outline the main Personality tests and their value in clinical assessment.
Session 8 (Week 9)	Adulthood and Sexual Behaviour • Describe the characteristics of Adulthood. • Outline the interconnection between psychological and biological characteristics of this stage of human development. • Distinguish between Psychoanalytic and Psychological views on sexuality. • Describe the role of sex in human relationships • Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.
Session 9 (Week 10)	• Sleep, Consciousness, Family Aging, Death and Bereavement • Explain the different stages of sleep as described by EEG studies Outline the three theories of sleep. • Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation. • Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.

	• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family. • Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected. • Outline the impact of death on both the dying person and the family.
Session 10 (Week 11)	Psychology and Medicine: Patients and Doctors • Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions. • Outline the Biomedical and the Biopsychosocial Approaches to Medicine. • Identify the advantages and disadvantages of each approach in the development of modern medicine. • Outline the impact of psychological principles in doctor patient contact and communication.
Session 11 (Week 12)	Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment • Describe the different factors contributing to the impact that hospitalisation has on people. • Describe the potential psychological impact that hospitalisation may have on people. • Outline the role of psychosocial approaches in medical practice. • Outline the role of placebo effect in the treatment of both physical and psychological treatments. • Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis. • Outline the way by which psychological factors contribute to the development of somatic problems. • Describe different types of psychosomatic problems. • Outline possible ways of distinguishing between psychosomatic and physical problems.
Session 12 (Week 13)	Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation • Outline the psychological factors contributing to coping with illness and disability. • Describe the different approaches and techniques employed for coping with these difficulties. • Outline the different areas of Psychopathology. • Outline the methods employed in the diagnosis of psychological and psychiatric disorders. • Outline the treatments often used in the treatment of psychiatric and psychological disorders. • Explain what is meant by chronic mental illness and the process of rehabilitation.
Session 14 (Week 14)	**Midterm Exam**

Session 16 (Week 16)	• Teaching Principles
Session 17 (Week 17)	• Student Centered vs. Teacher Centered Learning
Session 18 (Week 18)	• Learning Styles
Session 19 (Week 19)	• Creating a Lesson: Overview Creating a Lesson: Goals • Creating a Lesson: Outcomes
Session 20 (Week 20)	• Creating a Lesson: Information Delivery
Session 21(Week 21-22)	• Teaching Methods
Session 22 (Week 23)	• Creating a Lesson: Activities
Session 23 (Week 24)	• Creating a Lesson: Measurement
Session 24 (Week 25)	• Creating a Lesson: Evaluation
Session 25 (Week 26)	• The Teacher's Responsibilities
Session26(Week27-28)	• Presentations
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Professional Ethics

1	**Course name**	**Professional Ethics**
2	**Course Code**	**MT207**
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	The content is designed to enable the student to be aware of the basic rules of medical ethics. The student will become familiar with the definitions and ethical behavior that is required by the healthcare professional.
Textbooks required for this Course:	• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير • مقدمة في زراعه الاعضاء، د. الهادي عصمان • WMA medical ethics manual 2015 • Principles of Biomedical Ethics, 5th edn. • https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lectures, Problem based learning and Class discussion.
Course Objectives:	This course introduces medical technology students to the field of medical ethics. The objective of the course is: • To convey to students, the pivotal role ethics holds in medical practice. • It introduces the key underlying ethical principles required in medicine. • The application of these principles will be brought to life through case based learning (CBL). • Recognize ethical issues when they arise in their practice • Deal with these issues in a systematic manner • Understand the ethics of medical research • To create an awareness on medical Ethics and Human Values. • To instill Moral and Social Values and Loyalty • To appreciate the rights of others.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 %

	A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction and history of medical ethics
Session 2 (Week 2)	Principles of medical ethics
Session 3 (Week 3-5)	Physicians and patients, Physicians and society Physicians and colleagues
Session 4 (Week 6 -7)	Ethics of medical research
Session5 (Week 8 - 9)	Informed consent
Session6 (Week 10 - 11)	Ethics of gynecology and obstetrics Ethics of infertility
Session 7 (Week 12 -13)	Ethics of healthcare system
Session 8(Week 14)	Professionalism
Session 10(Week 15)	Review and general discussion
Session 11(Week 16)	**Med term exam**
Session 12(Week17-18)	Medical errors
Session13(Week 19-20)	Libya law of medical responsibility
Session 14 (Week 21-22)	Humanism in medicine and Ethics of end of life
Session 15 (Week 23)	Ethics of authorship and publication
Session 16 (Week 24-25)	Ethics of medical education
Session 17 (Week26-27)	Theories of ethics
Session18(Week28)	Revision and discussion
Session19(Week 29-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Health Management

1	**Course name**	**Health management**
2	**Course Code**	MT208
3	**Course type: /general/specialty/optional**	General
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Health Care Management provides a framework for addressing management problems in health care organizations. By the end of the course you will have been exposed to many management ideas, theories and applications, students will be able to: Know the process of communication and its nature, and get to know the environment surrounding the hospital. Identify the forms and types of management, Getting to know the correct and nursing information collection system
Textbooks required for this Course:	• Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2). • Buchbinder, S.B., & Shanks, N.H. (2012). Introduction to Health Care Management Jones & Bartlett, Publishers, 2nd Edition. • Essential Textbook of Health Management 2. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8. • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	One academic year
Delivery	A Lecture-based ppt and practical training B Group interaction and discussion
Course Objectives:	Up on completion of the course the students wiil be enable to: • Learn concepts and theories in health care management; • Develop skills in using materials tools and/or technology central to health care mgt; • Learn to understand perspectives and values of health care management; • Develop the basic management skills and ability to work productively with others;

	• Learn to select, use, and critically analyze current HCMN research and literature; • Integrate health care management theory with real world situations • Develop the ability to work productively with others in diverse teams. • To have reliably demonstrated the ability to make decisions on sound grounds, and can understand the concept of the hospital, can arrange health services, structure the health facilities and develop administrative skills.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown Topical Coverage	Content Breakdown Topical Coverage
Session 1 (Week 1)	An Introduction to the Health management
Session 2 (Week 2)	The historical role of medical and nursing health services
Session 3 (Week 3)	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
Session 6(Week 6)	Hospital concept and classification hospital environment
Session 7 (Week 7)	Hospital health planning
Session 8 (Week 8)	The organizational structure of the hospital
Session 9(Week 9)	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
Session 10(Week 10	Outpatient & In Patient Services in the Following Fields (Basic knowledge only): Radiotherapy, Nuclear medicine, surgical units, and OT Medical units, G & Obs. units & LR. Pediatric, neonatal units, Critical care units, Rehabilitation. Skin, Eye, ENT, Neurology, Dental, Gastroenterology, Endoscopy, Pulmonology, Cardiology, Cath lab, Nephrology & Dialysis, Urology, Orthopedics, Transplant units, Burn Unit
Session 11(Week 11)	Medical Record Science Definition and types of medical record, Importance of medical record, Flow chart of function, Statutory requirements of maintenance, coding, indexing and filing, Computerization of record, Report and returns by the record department, Statistical information and ICD
Session 12(Week 12)	Leadership and management An overview of healthcare management and leadership
Session 13(Week 13)	Management and motivation
Session 14(Week 14)	Midterm Exam
Session 15(Week 15)	Organizational Behavior (OB) and Management Thinking
Session 16(Week 16)	Quality Improvement
Session 17(Week 17)	Health care information Technology Health and Nursing Information Collection System
Session 18(Week 18)	Healthcare Financing, Cost and revenue management

Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources
Session 20(Week 21)	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
Session 21(Week22)	Fraud and abuse
Session 22(Week 23)	Communication, health administration
Session 23(Week 24)	Administrative Support in Healthcare Organizations
Session 24(Week 25)	Clinical Care in Healthcare Organizations
Session 25(Week 27)	Medical Laboratories Management
Session 26(Week 28)	Revision and discussion
Session 27(Week 29-30)	Final Exam
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ب. المقررات الدراسية للسنة الثالثة قسم تقنية التغذية

Food Analysis

1	**Course name**	**Food Analysis**
2	**Course Code**	**NT301**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Food chemistry
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with this course student will undertake and compare various food analysis techniques, followed by analysis, interpretation and presentation of the results. Upon completion of this course, students will have the knowledge and skills to apply and assess the principles and practices required for the analysis of foods.
Textbooks required for this Course:	• Food Analysis Laboratory Manual by S. Suzanne Nielsen second edition,2010, DOI https://doi.org/10.1007/978-1-4419-1463-7 • Methods in Food Analysis Edited By Rui M. S. da Cruz, Igor Khmelinskii, Margarida Vieira 1st edition 2014 • Chemical Analysis of Food Techniques and Applications by Yolanda Pico2nd Edition - June 16, 2020 • Food analysis – textbook 5th edition by Reinhard Matissek, Gabriele Steiner, Markus Fischer 2014 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to:

	• Apply valid sampling techniques to food materials having widely diverse properties and volumes; • Select appropriate analytical techniques for specific food components; • Compare advanced and conventional techniques and instruments to analyses chemical and physical properties of foods; • Apply a range of chemical analyses of food components; • Analyze, interpret and report on results obtained in a scientific format.
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1-2 (Week 1-2)	Safety and security in the food analysis laboratory
Session 3-5 (Week 3-5)	The importance of standard specifications (local and international)
Session 6 (Week 6)	Introduction to food analysis
Session 7 (Week 7)	Sampling, Population.....ect
Session 8-12 (Week 8-12)	Physical methods of food analysis
Session 13(Week 13)	**Midterm Exam**
Session 14 (Week 14-20)	Analysis of food moisture, ash, total carbohydrates, fat and proteins.
Session 15 (Week 21-23)	Analysis of vitamins
Session 16 (Week 24-26)	Natural, chemical and organoleptic properties of honey
Session 17 (Week 27-28)	Analysis of minerals
Session 18 (Week 29)	Revision and discussion
Session 19 (Week 30-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates

	have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Nutrition Through Lifespan

1	**Course name**	**Nutrition Through Lifespan**
2	**Course Code**	**NT302**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Biology
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will explore and provides students with understanding how nutrient needs vary during the lifespan, from nutrition during preconception, pregnancy and lactation, infant nutrition, childhood and adolescent nutrition.
Textbooks required for this Course:	• https://nutritionguide.pcrm.org/nutritionguide/view/Nutrition_Guide_for_Clinicians/1342043/all/Nutritional_Requirements_throughout_the_Life_Cycle • https://med.libretexts.org/Bookshelves/Nutrition/Book%3A_Nutrition_Science_and_Everyday_Application_(Callahan_Leonard_and_Powell)/11%3A_Nutrition_Throughout_the_Lifespan • https://www.betterhealth.vic.gov.au/health/healthyliving/food-and-your-life-stages • Krause's Food & Nutrition Therapy 12th Edition by L. Kathleen Mahan MS RD CDE , Sylvia Escott-Stump MA RD LDN 2007

	• Nutrition Through the life cycle-7th-Edition by Judith E. Brown 2019 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture and discussion, self-directed activities, active participation.
Course Objectives:	By the end of this chapter you will be able to: • Understand the physiological change at different stages of life. • Identify food groups and nutrients. • Recognize effect of growth and development on nutritional need • Appreciation of the nutritional needs for each age group. • Understand the most important nutritional health problems. • Describe the physiological basis for nutrient requirements from pregnancy through the toddler years. • Describe the physiological basis for nutrient requirements for the elderly
Course Assessments	Activities 10% Midterm exam20% Attendances 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction
Session 2 (Week 2-3)	Elements of nutrients and human beings
Session 3 (Week 4-5)	Food groups.
Session 4 (Week 6-7)	Nutrients (macro. & micro).
Session 5 (Week 8)	Simple definition for each stage of life
Session 6 (Week 9-10)	pregnancy & physiological change
Session 7 (Week 11)	RDA for pregnant
Session 8 (Week 12-13)	Lactation and nutrients need
Session 9 (Week 14)	Weaning & recommendation
Session 10 (Week 15-16)	Nutritional recommendation for toddler
Session 11 (Week 17)	**Midterm Exam**

Session 12 (Week 18)	Eating disorders during toddlers
Session 13 (Week 19-20)	The major growth & development during childhood
Session 14 (Week 21-22)	RDA for preschool age & school age group
Session 15 (Week 23-24)	The physiological ,emotional & nutritional change during puberty
Session 16 (Week 25-26)	Stages of adolescent & RDI
Session 17 (Week 27)	Pregnant adolescent & nutritional needs
Session 18 (Week 28)	Nutritional need during adults & nutritional problems Old age (hormonal change & eating disorders)
Session 20 (Week 29)	Revision and discussion
Session 21 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed.
Generic Skills	Interpersonal communications and critical thinking skills will be embedded in all courses.
Course Change	Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs.

Nutritional Epidemics and Toxicology

1	**Course name**	**Nutritional Epidemics and Toxicology**
2	**Course Code**	**NT303**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	In this introductory course, students will learn and apply basic concepts of nutritional epidemiology and toxicology. The course will review methodological issues involved in the design, conduct, analysis

	and interpretation of studies investigating the relationship between diet and disease. In addition, this course aims at increasing students understanding of the possible toxic and non-toxic effects of food intake.
Textbooks required for this Course:	• Willett WC, et al. Reproducibility and validity of a semi-quantitative food frequency questionnaire. Am J Epidemiol. 1985 Jul;122(1):51-65. http://aje.oxfordjournals.org.ezp-prod1.hul.harvard.edu/content/122/1/51.full.pdf+html • Textbook: Willett, Nutritional Epidemiology, 3rd edition .(Also available online: https://tinyurl.com/300-W19-HSPH-ID-214-1) • Nutritional Epidemiology by Walter Willett (3nd edition, Oxford University Press, 2013). Available atUniversity Bookstore. • Intuitive Biostatistics by Harvey Motulsky (Oxford University Press, 1995 • Epidemiology. An Introduction. by Kenneth Rothman, (Oxford University Press, 2002 • Design Concepts in Nutritional Epidemiology by Barrie Margetts and Michale Nelson (2nd edition,Oxford University Press, 1997) • Nutritional health : Strategies for disease prevention, edited by Norman J. Temple, Ted Wilson, David R. Jacobs, (Humana Press, 2006)Principles of Nutritional Assessment, Second Edition by Rosalind S.Gibson (Oxford University Press, 2005) • Principles of Epidemiology A Self-Teaching Guide1st Edition - January 1, 1982 ISBN: 9781483276342. • Willett W. Nutritional Epidemiology. Chapters 4 and 5: 24-hour Recall and Food Record Methods and Food Frequency Methods • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	• Upon completion of this course, the student should have the ability to: • Understand where the disease is coming from, and who it is most likely to impact. Discover patterns and trends in health problems. • Predict the number of cases of a disease and its distribution in the population. • Explain the etiology of disease. • Study the course of a disease quantitatively from onset to outcome. • Assess preventive measures and treatment options.

	• Define basic scientific terminology and describe core concepts in toxicology as they apply to nutrition and the food supply. • Distinguish between different types of research study designs and explain some advantages and disadvantages of specific methodological approaches. • Identify and describe different sources of toxicity in the food supply and discuss their potential effects on health. • Critically evaluate findings from the scientific literature on a specific, potentially toxic substance found in the food supply.
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	**Basic principles of epidemiology**
Session 2 (Week 2-3)	**Introduction to the study of nutritional epidemiology** Role of this science in evaluating diet and disease relationships; overview of role of diet in disease causation.
Session 3 (Week 3)	Research designs: observational epidemiology and clinical trials
Session 4 (Week 4)	How strong is diet's influence on disease?: statistical tools used to describe and interpret epidemiologic data
Session 5 (Week 5)	Lifestyle and other confounding factors that may explain or alter relationships of diet to disease and how to control for them; physical activity and energy adjustment
Session 6 (Week 6)	Analytic strategies to evaluate genetic and other factors modifying diet and disease relationships: • resources for genetic data in epidemiological studies
Session 7(Week 7-9)	**Measurement of nutritional exposures** • overview of techniques; overview of dietary exposures; assessing diet exposure with biological markers, assessing diet: introduction and variation in diet • Analysis of dietary data-daily and food frequency methods; nutrient composition and supplement databases • Discussion of diet assessment project: the estimation of and effects of measurement error; calibration and validation studies
Session 8 (Week 10)	Diet assessment results discussion

Session 9 (Week 11)	A broader look at nutrition- dietary patterns. tools to study them and to evaluate their relation to health and disease Examine major dietary patterns which reflect: adherence to us dietary guidelines, mediterranen diet patterns, dash diet patterns
Session 10 (Week 12)	Nutrition monitoring in the Libya
Session 11 (Week 13)	Interpreting the epidemiologic literature
Session 12 (Week 14)	Students presentations and discussion
Session 14(Week 15)	**Midterm Exam**
Session 16 (Week 16)	Introduction to Nutritional Toxicology
Session 17 (Week 17-18)	Natural Toxins and Toxicants
Session 18 (Week 19-20)	Toxicity tests and toxicogenomic in nutrition
Session 19 (Week 21)	Dietary Reference Intakes for Toxicity
Session 20 (Week 22)	Gut Microbiome and Toxicity
Session 21 (Week 23-24)	Excess of nutrients and toxicology
Session 22 (Week 25-26)	Gene-food toxicant interactions
Session 23 (Week 27)	Food Safety and regulations
Session 24 (Week 28)	Students presentations
Session 25 (Week 29)	Discussion and revision
Session 26(Week30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of

	changes to students as soon as possible. Timetable may also be revised.

Management & Quality Control of Foods Services in Hospital

1	**Course name**	**Management & Quality Control of Foods Services in Hospital**
2	**Course Code**	**NT304**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Principle of Food safety & Quality
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with Fundamentals of quality control and their application through physical, chemical, microbiological, statistical and sensory methods will be studied. Statistical process control (SPC) will be mainly covered; required background knowledge of statistics will be reviewed briefly.
Textbooks required for this Course:	• Food Quality Assurance: Principles and Practices by Alli, I. 2004. • https://ncert.nic.in/textbook/pdf/lehe104.pdf • https://psu.pb.unizin.org/hmd329/chapter/ch1/ • • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Describe the background and current requirement for quality control and quality management systems. • Explain what has led to the current quality management systems Outline the main requirements of a quality control system

	• Recognize the requirements necessary to ensure safe, quality food. Identify conditions for inactivation of important pathogens commonly found in foods • Apply appropriate evaluation tools needed to produce a safe food. • Evaluate sanitary practices and environmental factors (i.e., Aw, pH, temperature) that control growth and response of microorganisms. • Describe techniques, including sensory evaluation, for determination of product quality. • Identify food quality specifications • Recognize the source and variability of raw food material and impact on food quality • Prioritize attributes/problems specification in raw and processed material based on production data • Illustrate how processing techniques can affect product quality. • Predict quality of selected products. • Ensure government regulations are reflected in the specifications provided • Apply appropriate sampling plans for a given attribute and product. • Use statistical methods to select appropriate sample plan • Develop sampling plan for a given data set • Construct and interpret an operating characteristics curve to effectively evaluate consumer and producer risks • Construct an operating characteristic curve based on statistical probabilities for a given data set. • Interpret the significance of a given point on the operating characteristic curve. • Compare different operating characteristic curves. • Create control charts for attributes, a vital segment of statistical process control (SPC), to record and report QC data.
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their

	textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	Introduction of food safety
Session 2 (Week 3-5)	Potentially hazardous foods
Session 3 (Week 6-8)	Employee Practices
Session 4(Week 9-11)	Food Flow And Food Protection
Session 5(Week 12-14)	Hazard Analysis Critical Control Points
Session 6 (Week 15)	**Midterm Exam**
Session 7(Week 16-18)	Equipment And Facilities
Session 8(Week 19-20)	Pest Control
Session9 (Week 21-23)	Mobile Food Service Units And Temporary Food Service Establishments
Session 10(Week 24-26)	Health Department Procedures, Policies, Permits, And Compliance
Session 11(Week 27-28)	Requests and Permits
Session 12 (Week 29)	Review and discussion
Session 13 (Week 30-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Therapeutic Nutrition I

1	**Course name**	**Therapeutic Nutrition I**
2	**Course Code**	**NT305**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	Therapeutic nutrition or medical nutrition therapy explores the role played by therapeutic diets in the treatment of chronic disease and other nutritional disorders. The course introduces the principles of the nutrition care process and will give knowledge and experience in nutrition assessment techniques and intervention strategies as applied to chronic disease and other nutritional disorders, this course will focus on the care of clients with pathologies caused by or causing nutritional impairments. General topics include nutrient delivery via oral, enteral, and parenteral routes, and interactions among foods, nutrients, medications, and supplements
Textbooks required for this Course:	• A Comprehensive Textbook of Nutrition and Therapeutic Diets for BSc Nursing Students by Darshan Sohi 2nd e edition 2018 • Therapeutic Nutrition: A Guide To Patient Education by Eileen Behan 2005 • Normal and Therapeutic Nutrition 17th Edition by Corinne H. Robinson, Marilyn R. Lawler, Wanda L. Chenoweth, Ann E. Garwick 1990 • https://alraziuni.edu.ye/uploads/pdf/fundamentals-of-foodnutrition-and-diet-therapy.pdf • Additional Resources:Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours

Delivery	Lecture-based, Group interaction and discussion, active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Understand the role of nutrition in the treating and preventing disease. • Familiarity with basic therapeutic nutrition. • Realizing the role of nutrition in treatment most of digestive diseases • Understand the role of nutrition in control liver disease • Acquired the necessary skills to treat malnutrition in the children. • Describe the methods used to adapt a normal diet to treat a specific clinical nutritional disorder. • Apply recent various methods and techniques in the field of therapeutic • nutrition. • Lists methods for preparation of normal food to adjust various pathological conditions. • Recommend dietary adjustments leading to better health outcomes and improved quality of life.
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	Clinical Nutrition and Dietetics
Session 3 (Week 3-4)	Diet, Nutrient and Drug Interaction
Session 5 (Week 5)	• Diet Modifications
Session 6(Week 6-7)	Dietary management in critically ill patients
Session 8 (Week 8)	Dietary management in Febrile condition
Session 9 (Week 9-10)	Dietary management of cancer
Session 11 (Week 11-14)	Dietary management in deficiency diseases
Session 12 (Week 15)	**Midterm Exam**
Session 13(Week 16-19)	Dietary management in Surgery Burns , Trauma and Sepsis

Session 14 (Week 20-23)	Dietary management in Weight Imbalance , Obesity ,Underweight and eat disorder
Session 15 (Week 24-27)	Dietary management in allergy and Nervous System Disorders
Session 16 (Week 28-29)	Revision and discussion
Session 17 (Week 30-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Food Microbiology

1	**Course name**	**Food Microbiology**
2	**Course Code**	**NT306**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	General microbiology
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course covers the food microbiology and the important equipment used to provide. It also gives a general information about Microbiology, and the problem of microbiology in food. It also covers the laboratory safety issues and the important precautions needed to be taken before, during, and after finishing the laboratory work. Occupational health and safety (definition, aims, quality, requirements, and procedure). How to promote occupational health and safety in work place. Occupational hazards, Occupational risk for nutritionist. Laboratory safety, universal precaution in laboratory, waste disposal.
Textbooks required for this Course:	• Food Microbiology: An Introduction 3rd Edition by Thomas J. Montville, Karl R. Matthews, Kalmia E. Kniel 3rd edition 2012 • Food Microbiology: Fundamentals and Frontiers, 5th Edition by Michael P. Doyle, Francisco Diez-Gonzalez, Colin Hill 2019 • http://nuristianah.lecture.ub.ac.id/files/2014/09/fundamental-food-microbiology.pdf • Microbial Control and Food Preservation Theory and Practice by Vijay K. Juneja, Hari P. Dwivedi, John N. Sofos 1st edition 2010 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	Upon completion of this course, the student shuld have the ability to: • Distinguish the types of Microbiology. • Describe disease to person from poising food. • Explain the procedures, operations and treatments to save the person. • Determine through symptoms and sings the appropriate diagnosis for the condition. • Understand the framework of the Health and Safety at Work etc. • Evaluate hazards and risks in order to carry out a risk assessment. • Understand the legal requirements to report any Microbiology. • Know the types of microorganisms that cause food poisoning • Knowing how to preserve food • Develop risk assessments for scientific laboratories that use chemicals or biological organisms or both. • State the various controls that protect laboratory personnel, including engineering, administrative, work practices, and personal protective equipment.
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their

	textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to food microbiology
Session 2 (Week 2)	Foods as a substrate for microorganisms
Session 3 (Week 3)	Basic concepts and scope of food microbiology
Session 4 (Week 4)	Study of primary sources of microorganisms in foods
Session 5 (Week 5)	Effect of intrinsic (pH, moisture content) and extrinsic (temperature and relative humidity) factors on microbial growth in various foods.
Session 6 (Week 6)	Effect of intrinsic (pH, moisture content) and extrinsic (temperature and relative humidity) factors on microbial growth in various foods.
Session 7 (Week 7)	Microbial Spoilage of various foods
Session 8 (Week 8)	Effect of outer covering –spoilage of intact fruits and fruits with damaged skins.
Session 9 (Week 9)	Study of spoiled vegetable, bread and egg samples
Session 10 (Week 10)	Study of spoiled vegetable, bread and egg samples
Session 11 (Week 11)	Study of spoilage of milk for acid, gas and proteolysis
Session 12 (Week 12)	Methods of food Preservation
Session 13 (Week 13)	Comparison of shelf life of pasteurized, UHT milk, raw milk both at low and room temperature
Session 14 (Week 14)	Comparison of shelf life of pasteurized, UHT milk, raw milk both at low and room temperature
Session 15 (Week 15)	Study of specimens of various canned foods (vegetables, fruits, pickles etc) and treatments given to them for preservation
Session 16 (Week 16)	Study of specimens of various canned foods (vegetables, fruits, pickles etc) and treatments given to them for preservation
Session 17 (Week 17)	**Med-term Exam**
Session 18 (Week 18)	Food preservation: Physical, chemical and biological methods
Session 19 (Week 19)	Food preservation: Physical, chemical and biological methods
Session 20 (Week 20)	Microbiology and Process of Fermented Foods
Session 21 (Week 21)	Use of starter cultures and preparation of Dahi
Session 22 (Week 22)	To perform various tests such as pH and titratable acidity of various fermented milk products(yogurt,market dahi, etc) available in market

Session 23 (Week 23)	To perform various tests such as pH and titratable acidity of various fermented milk products(yogurt,market dahi, etc) available in market
Session 24 (Week 24)	Surveying of probiotic drinks available in the market
Session 25 (Week 25)	Food-Borne Diseases
Session26(Week26-29)	Case studies of food intoxications
Session27(Week30)	Revision and discussion
Session28(Week31-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Food Elements & Metabolism

1	**Course name**	**Food Elements & Metabolism**
2	**Course Code**	**NT307**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2 units
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Biochemistry
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the nature of food elements & nutrition.
Textbooks required for this Course:	• Lippincott Illustrated Reviews: Biochemistry (Lippincott Illustrated Reviews Series) 7th Edition • by Denise Ferrier 2017 • https://faculty.ksu.edu.sa/sites/default/files/nutrition_and_metabolism.pdf • Introduction to nutrition and metabolism by David A Bender 3rd edition 2002 • Nutrient Metabolism Structures, Functions, and Genes by Martin Kohlmeier2nd Edition - May 8, 2015 • Additional Resources:Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Understand the nature of food elements and their metabolism. • Identify several problems linked with human abnormal metabolism • Recognize the features of diseases caused by altered metabolism • Identify representations, terms, conditions, and concepts related to food elements and their bioloical significance • Recognize different strategies to study their biomedical importance. • Construct a usefull model to investigate the relations between each food element with other food lements and metabolic alterations associated with them
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to food elements and metabolism
Session 2 (Week 2)	Types of foods and Elements of foods

Session 3 (Week 3)	Electrolytes and their medical significance
Session 4 (Week 4	Calcium and phosphorus
Session 5 (Week 5-6)	iron, selenium ,magnesium, iodine and others
Session 6 (Week 7-8)	Oxidative phosphorylation and Electron transport chain
Session 7 (Week 9 & 10)	Lipids and their functions Classifications of lipids
Session 8 (week 11 to 13)	Cholesterol and its biological and biochemical functions Cholesterol transport and synthesis
Session 9 (week 14)	Triglycerides and their functions
Session 10 (Week 15)	**Midterm Exam**
Session 11 (week 16-17)	Metabolic disease associated with of fatty acids and triglycerides
Session 12 (week 18-21)	Amino acids and proteins Metabolic diseases linked with of amino acids and proteins
Session 12 (Week 22-27)	Carbohydrate metabolism
Session 13 (Week 28)	Metabolic diseases associated with carbohydrates
Session 14 (Week 29)	Revision and discussion
Session 15(Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Nutrition of Animal Sources

1	**Course name**	**Nutrition of Animal Sources**
2	**Course Code**	**NT308**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Nutrition during lifespan
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with The physicochemical properties of milk, as are the processing methods involved in the conversion of milk to other dairy products such as cheese, yoghurt and butter. The chemistry, structure, composition, properties, uses, and method of processing of animal food such as eggs, fish meat and meat products are also examined. By completing this course, students will appreciate the properties of animal-based foods and explain the processing methods of animal foods.
Textbooks required for this Course:	• Food Science by Roday,S first edition Journal of Agri. & Food- once a month- online. • Principles of Animal Nutrition ByGuoyao Wu 1st edition 2017 • file:///C:/Users/BMI/Downloads/99368-Article%20Text-261804-1-10-20140109.pdf • Control of Products and Food of Animal Origin, Universitary Textbook 1st Edition Publisher: PIMEditor: Publishing House "Ion Ionescu de la Brad" IasiISBN: 978-973-147-139-6, 2017 • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	Upon completion of this course, the student should have the ability to:

	• Explain the composition, structure and function of meat, eggs, milk and fish. • Identify and describe the physical and biochemical changes occurring during the conversion of muscle to meat; • Describe and evaluate the implication of storage and processing operations on the quality of selected foods of animal origin; • Collect and interpret the data of experiments on the effect of processing conditions on quality parameters of animal food products; • Identify and explain the product composition, quality and production process of commercially available selected animal food products.
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction
Session 2 (Week 2-3)	Impart basic knowledge of animal food products
Session 4(Week 4-5)	Meat, Poultry and Fish :Definition , composition and nutritional properties
Session 5 (Week 6-7)	Topics to be covered in the session (week) physical ,chemical , nutritional of eggs
Session 6(Week 8-10)	Milk and Milk Products Chemical composition of milk, its constituents
Session 7(Week 11)	processing of milk and its types
Session 8 (Week 12)	**Midterm Exam**
Session 9(Week 13-17)	Fermented dairy: cheese and its kinds, yogurt, butter, ghee , sour milk , cream.
Session 10(Week 18-21)	Nutritional properties of fermented dairy products
Session11 (Week 21-23)	Bee's honey Kinds of honey
Session 12(Week 24-26)	natural, chemical and organoleptic properties of honey
Session 13 (Week 27)	Bee honey preservation

Session 14 (Week 28)	Review and discussion
Session 15 (Week 29-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Pharmacology and Nutrition

1	**Course name**	**Pharmacology and Nutrition**
2	**Course Code**	**NT309**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2units
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Physiology
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will introduce the basic concepts of pharmacology and the different classes of medicinal compounds that are in use. Differences and similarities between drugs, nutrients and dietary supplements will be addressed, as well as the way these are discovered and developed into products. Attention will also be given to the consequences of drug formulation for the dose-	

	regimen and effect(s). Examples from clinical therapy will be used to illustrate pharmacotherapy. Finally, the interaction between nutrients and drugs will be studied.
Textbooks required for this Course:	• Basic Pharmacology: Understanding Drug Actions and Reactions (Pharmacy Education Series) 1st Edition by Maria A. Hernandez Ph.D. , Appu Rathinavelu Ph.D.2006 • Pharmacology and drug administration for imaging technology book. • Handbook of Food-Drug Interactions (Nutrition Assessment) (Hardcover) by Beverly J. McCabe (Editor), Eric H. Frankel (Editor), Jonathan J. Wolfe (Editor) Publisher: CRC (April 29, 2003) ISBN: 084931531X • Handbook of Drug-Nutrient Interactions (Nutrition and Health (Totowa, N.J.).) (Hardcover) by Margaret Malone (Foreword), Joseph I., Ph.D. Boullata (Editor), Vincent T., M.D. Armenti (Editor) Publisher: Humana Press (May 17, 2004) ISBN: 1588292495 • A-Z Guide to Drug-Herb-Vitamin Interactions Revised and Expanded 2nd Edition: Improve Your Health and Avoid Side Effects When Using Common Medications and Natural Supplements Together (Paperback) by Alan R. Md Gaby (Editor), Inc. HealthnotesPublisher: Three Rivers Press; 2nd Rev&Ex edition (February 28, 2006) ISBN: 0307336646 • Herb Contraindications And Drug Interactions, Second Edition (Paperback) by Francis Brinker, Nancy Stodart (Editor) Publisher: Eclectic Medical Pubns; 2nd Rev edition (December 1, 1998) ISBN: 1888483067 • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	2 8 28 = 56 teaching hours
Delivery	Lecture-based.Group interaction and discussion. Self-directed activities. Active participation.
Course Objectives:	Upon completion of this course, the student will have the ability to: • Acquire new knowledge in pharmacology by conducting and promoting innovative research. • Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs. • Report the clinical applications, side effects of drugs used in medicine. • Translate pharmacological principles into clinical decision making. • Define drug-food interactions

	• Understand the biochemical metabolic mechanisms involved in drug-food interactions. • Understand what recommendations to make to prevent undesirable drug interactions
Course Assessments	Midterm Exam 20% Attendance10% Activities 10% Final Exam: 60%. A 60% is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use and design any assignment that may be beneficial to the student-learning outcome
Content Breakdown	**Topical Coverage**
Session 1 (Week 1)	Introduction to pharmacology
Session 2 (Week 2)	Pharmacy Basic Concepts
Session 3 (Week3-4)	Drug sources, Routes of drug administration and Pharmacokinetics.
Session 5 (Week5-6)	Biopharmaceutics of Orally ingested products. Sympathetic depressants.
Session 6 (Week 7)	Drug Interactions: Basic concepts
Session7 (Week 8)	Nutrition and Metabolism of drugs
Session8 (Week9-11)	Monitoring Nutritional Status in Drug Regiments
Session9 (Week 12-13)	Gastrointestinal and metabolic disorders and Drugs
Session10 (Week 14)	**Midterm exam**
Session11 (Week15-16)	Drug interactions in nutritional support
Session12 (Week17)	Alcoholism and Nutrition
Session 13 (Week 18-19)	Nutrition and Drug regiment in older people
Session 14(Week 20-21)	Obesity and appetite drugs
Session 15 (Week 22-23)	Non-prescription drugs and nutrient interactions
Session 16 (Week 24-25)	Herbal and dietary supplements interactions with drugs
Session17 (Week 26-27)	Dietary counselling to prevent food-drug interactions
Session 18 (Week 28)	Revision and discussion
Session 19 (Week 29-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until

	class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Research Methodology

1	**Course name**	Research Methodology
2	**Course Code**	MT301
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Medical Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will provide students with a fundamental understanding of the research Methodology and offers "An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research.
Textbooks required for this Course:	• Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers (ISBN: 978-1-4422-0964-0). • Cohen, L. Lawrence, M., & Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press. • Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press. • Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press. • Hoadjli, A.C. (2015). The Washback Effect of an Alternative Testing Model on Teaching and Learning: An exploratory study on EFL secondary classes in Biskra. Unpublished Doctoral Thesis, University of Mohamed Kheider, Biskra.

	• Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers. • Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition).London, UK: TJ International Ltd, Padstow, Corwall • Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc. • Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers. • Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications. • http://www.pitt.edu/~super7/43011-44001/43911.ppt • http://web.tamu-commerce.edu/academics/graduateSchool/ • Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
Course Objectives:	Upon completing this course, each student will be able to: • Understand some basic concepts of research and its methodologies and identify appropriate research topics. • Demonstrate knowledge of research processes (reading, evaluating, and developing). • Perform literature reviews using print and online databases. • Understand the formats for citations of print and electronic materials. • Identify, explain, compare, and prepare the key elements of a research proposal/report. • Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them. • Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research. • Describe sampling methods, measurement scales and instruments, and appropriate uses of each. • Explain the rationale for research ethics and importance • select and define appropriate research problem and parameters • prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • Write a research report, thesis and research proposal. • Make Critical Appraisal of the Literature
Course Assessments	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to research methodology • Meaning of Research • Definitions of Research • Objectives of Research

Session 2 (Week 2)	Introduction to research methodology • Motivation in Research • General Characteristics of Research • Criteria of Good Research
Session 3 (Week 3)	The Research Problem • Scientific Thinking • What is a Research Problem? • Selecting the Problem • Sources of the Problem • Defining a Problem • Statement of a Problem • Delimiting a Problem • Evaluation of a Problem Assignment 1 handed out
Session 4 (Week 4)	•The Review of Literature • Meaning of Review of Literature • Need of Review of Literature • Objectives of Review of Literature • Sources of Literature • The Functions of Literature • How to Conduct the Review of Literature • Some Hints for the Review of Literature • Precautions in Library Use • Reporting the Review of Literature
Session 5 (Week 5)	Practice on how to find a literature • Selecting a topic • Highlighting the electronic websites that help to better search of literature
Session 6 (Week 6)	The Research Hypotheses • Meaning of Hypothesis • Definitions of Hypothesis • Nature of Hypothesis • Functions of Hypothesis • Importance of Hypothesis • Kinds of Hypothesis • Characteristics of a Good Hypothesis • Variables in a Hypothesis • Formulating a Hypothesis • Testing the Hypothesis Assignment 2 handed out
Session 7 (Week 7)	The Research Approach • The Philosophical Background • The Qualitative Approach • The Quantitative Approach • The Mixed-Methods Approach
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs • Meaning of research design • Need for research design • features of a good design
Session 10 (Week 10)	Review

Session 11 (Week 11)	Assignment of research paper • selecting paper • guidelines of reading research paper
Session 12 (Week 12)	Assignment of research paper • Review before submitting the assignment
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	**Midterm Exam**
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling • Meaning and Definition of Sampling • Functions of Population and Sampling • Methods of Sampling • Characteristics of a Good Sample • Size of a Sample
Session 20 (Week 20)	Data Collection Methods • Questionnaires • Interviews • Focus Groups • Observation
Session 21 (Week 21)	Interviewing techniques • Face-to-face interview • Telephone interview • Computer based interview
Session 22 (Week 22)	Data management and analysis • Descriptive statistics • inferential statistics
Session 23 (Week 23)	Writing research proposal
Session 24 (Week 24)	Writing research report
Session 25 (Week 25)	Critical Appraisal of the Literature
Session 26 (Week 26)	Guidelines for submitting graduation project
Session 27 (Week 27)	Review of research methodology
Session 28 (Week 28)	Revision and discussion
Session 29 (Week 29)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

ج. المقررات الدراسية للسنة الربعة قسم تقنية التغذية

Nutritional Pathology

1	**Course name**	**Nutritional Pathology**
2	**Course Code**	**NT401**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology
8	**Instruction Language**	English
9	**Date of course approval**	2002-2001

Brief Description:	The Pathology and Nutrition course presents common pathological disorders and conditions that systematically stress their body systems, discuss underlying causes, and recommend nutritional strategies where appropriate. Students are able to describe the categories of pathologies and their effects on the major organ systems. They can translate pathological terms into common language and recognize specific pathologies from case histories and make nutritional recommendations based on their assessment.
Textbooks required for this Course:	• Robbins & Cotran Pathologic Basis of Disease10th Edition - May 18, 2020 • Nutritional Pathology Pathobiochemistry of Dietary Imbalance by H. Sidransky • Kumar, V., Abbas, A.K., Aster, J.(2017). Robinson Basic Pathology, 10th Edition. Elsevie • Nutritional Pathology: Pathobiochemistry of Dietary Imbalances (Biochemistry of Disease) 1st Edition by Herschel Sidransky. • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.

Course Objectives:	Upon completion of this course, the student should have the ability to: • Understand the common terms and definitions used in Nutritional pathology. • Identify of the nature of the disease related to nutrition. • Recognize the biological characteristics that distinguish each disease from the other based on types of nutrition. • Distinguish the origin of the disease and how it develops • Distinguishes between the causes of disease, its mechanisms, and the method of treatment • Infer the causes of disease and its growth patterns • Determines the appropriate diagnostic tools and mechanisms to detect the disease
Course Assessments	Attendances 10% Activities: 10% Midterm Exam 20% Final Exam: 60%A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction to Nutritional pathology
Session 2 (Week 2)	Malnutrition
Session 3 (Week 3)	Obesity
Session 4 (Week 4)	Metabolic syndrome
Session 5 (Week 5)	Diabetes Mellitus
Session 6 (Week 6)	Thyroid disease
Session 7 (Week 7)	Congenital metabolism errors
Session 8 (Week 8)	Carbohydrate metabolism& Aminoacid metabolism diseases.
Session 9 (Week 9)	Lipid metabolism: Dyslipidemia
Session 10 (Week 10)	Diseases of plasma proteins. Metabolism of purines. Gout
Session 11 (Week 11)	Pathology of the musculoskeletal system. Calcium and phosphorus metabolism disorders
Session 12 (Week 12)	Oncology: nutritional pathophysiology.
Session 12 (Week 12)	Advances in molecular nutrition (nutrigenomics)
Session 13 (Week 13)	Nutritional effects of alcohol
Session 14 (Week 14)	Gastrointestinal pathology.: esophageal dysphagia, gastroduodenal ulcer, heartburn, intestinal constipation and diarrhea
Session 15(Week 15)	**Midterm Exam**
Session 16(Week 16)	Malabsorption syndrome I. Celiac disease.
Session 17 (Week 17)	Malabsorption syndrome II. Short bowel syndrome. Inflammatory bowel disease
Session 18 (Week 18)	Liver and nutrition. Pancreatic insufficiency
Session 19 (Week 19)	Food allergy and food intolerance
Session 20 (Week 20)	Vitamin deficiency Hypervitaminosis
Session 21 (Week 21)	Diseases related to trace elements
Session 22 (Week 22)	Nutritional pathology in neurological diseases
Session 23 (Week 23)	Renal insufficiency. Dialysis, renal transplantation.

Session 24 (Week 24)	Nutritional pathology in cardiovascular diseases (hypertension, heart insufficiency, atheriosclerosis).
Session 25 (Week 25)	Nutritional pathology in respiratory diseases (COPD)
Session 26 (Week 26)	Nutritional pathology in surgical diseases I
Session 27 (Week 27)	Nutritional pathology in organ transplantation
Session 28 (Week 28)	Bariatric surgery
Session 29(Week 29)	Revision and discussion
Session30(Week30-32)	**Final exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The student should be able to work in a team The ability to perform tasks in accordance with ethical and professional principle. The student should be able to write a report on the diseased condition The student should be able to think critically to solve problems and make decisions
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Community Health and Nutritional Education

1	**Course name**	**Community Health and Nutritional Education**
2	**Course Code**	**MNT402**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Bachelor in Medical Technology Specializing in Nutrition Technology
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:	This course will provide an overview of concepts, empirical research, and public health practice in community health sciences with an emphasis on: (1) social context and	

	determinants of population health and (2) principles of planning interventions to protect and improve public health. The course describes ways to define and measure health and illness, the social construction of illness, social and behavioral determinants of health, and health disparities, including socioeconomic status (SES), race/ethnicity, gender, and age. Students will also learn about social and behavioral theories of health-related behavior change, health promotion strategies and methods, and public policy. The course provides case studies of evidence-based health promotion programs. It includes lectures, assigned readings, and in-class discussions.
Textbooks required for this Course:	• Essentials of public health approach by Jenison & Deft 8th Edition. • Community Nutrition: A Handbook for Health and Development Workers by Ann Burgess et al, 2009 • https://alraziuni.edu.ye/uploads/pdf/An-Introduction-to-Community-Health.pdf • https://dpi.wi.gov/sites/default/files/imce/community-nutrition/pdf/HealthyBites.pdf • https://www.ugc.ac.in/pdfnews/8280582_B.A.-Nutrition-and-Health-Education.pdf • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have reliably demonstrated the ability to: • Identify key cultural, social, political, economic, and psychological determinants of health and health- related behaviors. • Describe how health and health-related behavior are conceptualized and measured at the individual, community, and societal levels. • Explain theories of health-related behavior and behavior change • Define the basic elements of program planning and intervention. • Describe community organizing and community- based participatory research, as well as societal level initiatives. • Identify the major modes of advocacy for changing health policy pertaining to populations.
Course Assessments	Attendances 10% Activities: 10% Midterm Exam 20% Final Exam: 60% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course. Instructors are encouraged to use
Content Breakdown	**Topics Coverage**
Session 1 (Week 1 & 2)	• Introduction of community health science.

Session 2 (Week 3 & 4)	• Review about sociodemographic alert and health.
Session 3 (Week 5 & 6)	• Sex, Gender, and Health
Session 4 (Week 7 & 8)	• Principle of environmental issues and health
Session 5 (Week 9 & 10)	• Basic Principles and Methods of Epidemiology
Session 6 (Week 11 & 12)	• Basic Principles of occupational health.
Session 7 (Week 13 & 14)	• Prevention of non-communicable diseases: a global &nation
Session 8 (Week 15 & 16)	Prevention of communicable diseases
Session 9(Week 17)	**Midterm Exam**
Session 10 (Week 18 & 19)	• Strategies for Public Health Programs to Improve
Session 11 (Week 20 & 21)	• Adult Immunization
Session 12 (Week 22 & 23)	• Vaccination: A Cornerstone of Public Health
Session 13(Week 24 & 25)	• Essentials of Migration Management for Policy Makers and Practitioners
Session 14 (Week 26 & 27)	Nutrition related disease
Session 15 (Week 28 & 29)	Revision and discussion
Session 16 (Week 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Nutrition from of Plant Sources

1	**Course name**	**Nutrition from of Plant Sources**
2	**Course Code**	**MNT 403**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will serve as an introduction to the Cereal Economically important, cereal crops, wheat proteins and wheat flour nutritional composition, health benefit, and quality evaluation. Legumes and Nuts classification, structure and composition. Fruits and Vegetables classification and general composition. Fruit juices extraction and preservation. Spices definition and functional properties. Mycotoxins in spices and herbs.
Textbooks required for this Course:	• Foods of Plant Origin by Salunkhe, D.K 1st Edition. • Healing Through Nutrition: The Essential Guide to 50 Plant-Based Nutritional Sources Paperback by Eliza Savage 2020 • Plant-Based Keto: How to Cleanse Your Body, Reduce Inflammation, Cholesterol and Diabetes through Ketogenic Diet. Low-Carb Vegetarian Diet Plan to Lose Weight Quickly with 30 Tasty Veg Keto Recipes. Paperback by Lara Rush. 2022 • https://www1.villanova.edu/content/dam/villanova/dining/documents/Nutrition/Plant%20Based%20Diet%20Booklet.pdf • Book Launch: Plant-based Nutrition in Clinical Practiceby Ismailimail, 2022 • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Identify the different types of foods from plant origin natural or processed.

	• Use correct terminology to discuss the chemical, physical, and nutritional properties of foods from plant origin. • Identify and explain the side effects of excessive consumption of foods from plant origin. • Identify and explain the side effects of excessive consumption of foods from plant origin.
Course Assessments	Attendances 10% Activities: 10% Midterm Exam 20% Final Exam: 60% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course.
Content Breakdown	**Topical Coverage**
Session 1 (Week 1 -2)	Introduction to foods of plant origin, aim, and functions
Session 2 (Week 3-4)	Cereal Economically important cereal crops
Session 3 (Week 5-8)	Wheat proteins and Wheat flour : Nutritionl composation and health benefit ,Quality evaluation
Session 4 (Week 9-12)	Legumes and Nuts Classification ,Structure and composition
Session 5 (Week 13-15)	Fruits and Vegetables Classification of fruits and vegetables, general composition
Session 6 (Week 16)	**Midterm Exam**
Session 7 (Week 17-20)	Fruit juices: juice extraction and preservation Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gull bladder)
Session 8 (Week 21-24)	Spices definition and functional properties and Mycotoxins in spices and herbs
Session 9 (Week 25-27)	practical's: Cereals , Pulses and Vegetable and fruits
Session 10 (Week 28)	Revision and discussion
Session 111(Week29- 30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational

	employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Therapeutic Nutrition II

1	**Course name**	**Therapeutic Nutrition II**
2	**Course Code**	**MNT 404**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course introduces the role of medical nutrition therapy in the prevention and treatment of clinical diseases and disorders. This course aims to develop clinical knowledge and problem solving skills relevant to nutrition disorders, including aetiology& pathophysiology, as well as the nutrition care process including assessment, diagnosis, nutrition intervention planning, intervention evaluation and outcome management. The course includes topics in diabetes mellitus, cardiovascular disease, renal disease, Gastro-intestinal diseases, and cancer. Other pertinent topics include weight control, nutrition in critical care and during stress, nutritional needs of surgical clients, clients suffering burns
Textbooks required for this Course:	• Krause's Food & Nutritional Therapy • https://www.ejmste.com/download/food-technology-and-therapeutic-nutrition-in-the-biology-textbooks-of-the-intermediate-stage-5601.pdf • Nutrition Therapy and Pathophysiology by Nelms, Marcia, Sucher, Kathryn P., Roth, Sara Long 2nd edition 2010 • Fundamentals of Clinical Nutrition by Morgan, Sarah L., Weinsier, Roland L.2nd edition 1997 • Applications in Medical Nutrition Therapy by Zeman, Frances J., Ney, Denise M 2nd edition 1996 • Additional Resources: Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours

Delivery	Lecture-based, Group interaction and discussion, active participation.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Understand the role of nutrition in the treatment of endocrine disorder • Devising the most important nutritional recommendation for cancer patients. • Familiarity with important nutritional consideration for AIDS patients. • Awareness of the necessary nutritional aspects that must be taken into account for patients with kidney diseases, D M, anemia & HTN • Develop an individualized nutrition intervention plan, review the plan, and justify the nutrition management in relation to best evidence • Write a nutritional assessment, write a nutrition diagnosis & management. • Apply recent various methods and techniques in the field of therapeutic nutrition • Develop skills in various components of course module and working with patients • Recognize the Diet-Drug Interactions.
Course Assessments	Attendances 10% Activities: 10% Midterm Exam 20% Final Exam: 60%. A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	Introduction (explain the role of CHO in raising blood sugar)
Session 1 (Week 1)	glycemic index
Session 2 (Week 2)	Types of DM
Session 3 (Week 3-4)	Nutritional advice for gestational diabetes
Session 4 (Week 5)	types of anemia
Session 5 (Week 6-7)	Nutritional recommendation for each type of anemia
Session 6 (Week 8-9)	Hypertension (causes ,risk factors complication)
Session 7 (Week 10-11)	Nutritional recommendation (DASH diet)
Session 8 (Week 12-13)	Types of renal diseases
Session 9 (Week 14)	**Midterm Exam**

Session 10 (Week 15-16)	Nutritional recommendation for chronic & acute renal failure and ESRD
Session 11 (Week 17)	Kidney stone & dietary advice
Session 12 (Week 18-19)	Kidney transplant and nutritional recommendation
Session 13 (Week 20-21)	Types of dialysis
Session 14(Week 22-23)	Dietary recommendation for each type of dialysis
Session 15 (Week 24-25)	Cancer and dietary advice.
Session 16 (Week 26-27)	HIV and nutritional recommendation
Session 17 (Week 28)	Revision and discussion
Session 18 (Week 29-30)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time.
Generic Skills	Interpersonal communications and critical thinking skills will be embedded in all courses.
Course Change	. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs.

Immunity and nutrition

1	**Course name**	**Immunity and nutrition**
2	**Course Code**	**MNT405**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	3
5	**Educational hours**	4 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course will discuss basic immunology including cellular and molecular processes that represents the human immune system. Subjects to be presented include cells and organs of the immune system, antigen, immunoglobulins and antibody diversity, molecular mechanisms of innate and adaptive immunity. It will also

	include the effect of nutrition on the immune system functions. (interactions between nutrition and immune function) which is fundamental to understanding risk of both infectious and chronic diseases. Students will be provided with an in-depth understanding of how diet supports the optimal functioning of the immune system. Throughout the course, students will gain skills and understand the optimal process of immune function, including auto-immune conditions and balancing gut bacteria.
Textbooks required for this Course:	• Immunology 4th ed Paperback – 2 Feb. 2000 by Janis Kuby (Author), Richard A. Goldsby Thomas J. Kindt Barbara A. Osborne 2002. • https://studylib.net/doc/8013421/course-%23- • Nutrition and Immune Function. Edited by P.C. Calder, C.J. Fields, H.S. GillCABI Publishing; The Nutrition Society; New York, NY; 2002. • Additional materials will be handed during lectures and/or will be posted on the Webpage. • Nutrition & Immunology; Gershwin, German, Keen • Present Knowledge in Nutrition; Volumes I & II, 9thEdition (Bowman & Russell, editors); ILSI publisher; Washington DC 2006. • Essentials of Clinical Immunology 4th Edition by Helen Chapel, Mansel Haeney, Siraj Misbah, Neil Snowden 1999 • Additional textbooks and web links may be used in this course at the discretion of the instructor.
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
Course Objectives:	Upon completion of this course, the student will have the ability to: • Demonstrate the basic knowledge of immunological processes at a cellular and molecular level • Define central immunological principles and concepts • Outline, compare and contrast the key mechanisms and cellular players of innate and adaptive immunity and how they relate • Describe the interplay between the human immune response and nutritional status. • Explain the general effects of malnutrition on host immune function • Discuss the implications for nutritional interventions and disease control in low- and middle-income countries • Elucidate the genetic basis for immunological diversity and the generation of adaptive immune responses • Outline key events and cellular players in antigen presentation, and how the nature of the antigen will shape resulting effector response • Identify the main mechanisms of inflammation • Outline key events and cellular players governing mucosal immunity

	• Understand the principles governing vaccination and the mechanisms of protection against infectious diseases • Understand and explain the basis of immunological tolerance, autoimmunity and transplantation
Course Assessments	Attendances 10% Activities: 10% Midterm Exam 20% Final Exam: 60%. A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1)	• Introduction of immunology
Session 2 (Week 2)	• Immune organs and Innate immunity
Session 3 (Week 3)	• Antigen, Antibody and Antigen-antibody interactions
Session 4 (Week 4)	• Soluble Recognition receptors and cellular Recognition receptors
Session 5 (Week 5)	• Complement system, Innate immune response and Innate immune response
Session 6 (Week 6)	• Phagocytosis
Session 7 (Week 7)	• Overview of adaptive immunity
Session 8 (Week 8)	• Vaccination
Session 9 (Week 9)	• Basics of Humoral immunity and Cell mediate immunity
Session 10 (Week 10)	• Hypersensitivity and Autoimmune diseases
Session 11 (Week 11)	• Immune deficiency disease
Session 12 (Week 12)	• Transplantation
Session 13(Week 13)	• Overview of the global burden of malnutrition and infection
Session 14 (Week 14)	• Evaluation of the effects of nutrients on immune function
Session15(Week 15)	**Midterm Exam**
Session 16 (Week 16)	• Effect of Iron and Zinc status on immunity
Session 17 (Week 17)	• Effect of Selenium status on immunity
Session 18 (Week 18)	• Iodine and the immune response
Session 19 (Week 19)	• Vitamin A and Essential Amino Acids on immunity
Session 20 (Week 20)	• Specific amino acids & immunity:L-arginine; Glutamine; Sulphur amino acids; glutathione.
Session 21 (Week 21)	• Antioxidants and immunity (Vit E, C)
Session 22 (Week 22)	• Fatty acids & Immunity Nutrition, obesity, and immunity
Session 23 (Week 23)	• Nutritional modulation of autoimmune diseases/inflammation • Probiotics and Immunity
Session 24 (Week 24)	
Session 25 (Week 25)	• Breastfeeding mucosal immunity, and defense against infection • Nutrition, ageing, and the immune system
Session 26 (Week 26)	• Food allergy & immunity • Exercise, nutrition, and immunity
Session 27 (Week 27)	• Nutrition, HIV infection and immunity • Nutrition, immunity and alternative medicine
Session 28 (Week 28)	• Nutrition, Infection, and Immunity: Public Health Implications
Session 29 (Week 29)	Revision and Discussion
Session 30 (Week 30)	**Final Exam**

Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Healthy Nutrition and Fitness

1	**Course name**	**Healthy Nutrition and Fitness**
2	**Course Code**	**NT406**
3	**Course type: /general/specialty/optional**	specialty
4	**Accredited units**	2
5	**Educational hours**	2 hours per week
6	**Pre-requisite requirements**	Non
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022
Brief Description:		This course covers the nutrition and fitness, the important needs food for fitness. It also gives a general information about nutrition and fitness for health food for goof performs the body, and the problem to obtaining the most venerable nutrients for energy for the athletic human body from optimal food. Occupational health and safety (definition, aims, quality, requirements, and procedure). How to promote occupational health and safety in work place. Occupational hazards, Occupational risk for nutritionist.
Textbooks required for this Course:		• Sport and Exercise nutrition. Edited by Susan Ianham- New, Samanths Stear, Susan Shirreffs and Adam Collins

	• Nutrition for Health, Fitness and Sport by Melvin Williams, Eric Rawson, David Branch 11th Edition 2016 • Nutrition for Health, Fitness & Sport by Melvin Williams, Dawn Anderson, Eric Rawson 10th Edition 2012 • https://ncert.nic.in/textbook/pdf/kehe103.pdf • Principles of Nutrition Textbook, by Lisa Jellum et al 3rd Edition 2018 • Jellum, Lisa; Hitzeman, Jason; Knauss, Mark; Henderson, Sharryse; Harnden, Tom; Elsberry, Cynthia; and Ford, Greg, "Principles of Nutrition Textbook, Third Edition" (2018). Nursing and Health Sciences Open Textbooks. 5 • https://oer.galileo.usg.edu/health-textbooks/5 • Additional Resources: Additional textbooks and web links may be used in this course at the discretion of the instructor
Course Duration	2 * 28 = 56 teaching hours
Delivery	Lecture, group interaction and discussion, self-directed actives.
Course Objectives:	Upon completion of this course, the student should have the ability to: • Know the components of fitness • Distinguish between foods that provide the body with energy and foods that build the body • Know effect of hormones on giving energy to the body and their effect on metabolism. • Learn about catalysts and energy stimulants and their types. • Gain the knowledge of the appropriate time for athletes to eat food during competitions and training. • Introduce a career oriented and skill enhancing course on nutrition for fitness • Impart knowledge regarding importance of nutrition and exercise for physical, psychological, social and spiritual fitness of an individual. • Develop intellectual as well as physical skills the • Planning and execution of exercise and nutritional principles for fitness management. • Understand the importance of alternative therapies in the overall fitness of an individual • Develop entrepreneurial abilities in the field of fitness. • knowledge on changes in the human physiology during exercise. • Understand the role of exercise in fitness. • Understand the benefits of exercise in therapeutic conditions
Course Assessments	Attendances 10% Activities 10% Midterm Exam 20% Final exam 60% A 60 % is required for a pass in this course. Homework & Assignments Students will be required to read chapters in their textbook, handouts, and any other material necessary for the course.
Content Breakdown	**Topics Coverage**

Session 1 (Week 1-2)	Definition of fitness and its components.
Session 2 (Week 3-4)	Components sources and energy that the body needs from food.
Session 3 (Week 4 -5)	Study of macro-and micro-nutrients.
Session 4 (Week 6-7)	Study o macronutrients as an important source of energy.
Session 5 (Week 8-9)	Effect of carbohydrate deficiency in food on athletic performance.
Session 6(Week 10-11)	Knowing the right time to eat before high-effort performance.
Session 7 (Week 12)	Eating and drinking while performing.
Session 8(Week 13-14)	Eating after performing physical training.
Session 10 (Week 15)	**Med-term Exam**
Session 9(Week 16-17)	Effect of motor activity on food digestion.
Session 11(Week 18- 19)	Study types ergogenic aids
Session 12 (Week 20-21)	Nutritional ergogenic, the student's knowledge of its sources influence.
Session 13 (Week 22-23)	Hormonal regulation during exercise knowing the effect of hormones on the ability and performance of the athlete's body.
Session 14 (Week 24-25)	Sport nutrition
Session 15 (Week 26-27)	Digestion and Metabolism
Session 16 (Week 29)	Revision and discussion
Session 17 (Week 30-32)	**Final Exam**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until class is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.

Hospital Training

1	**Course name**	**Hospital Training**
2	**Course Code**	**MNT 407**
3	**Course type: /general/specialty/optional**	Specialty
4	**Accredited units**	2
5	**Educational hours**	6 hours per week
6	**Pre-requisite requirements**	Nutrition during life cycle / Medical Nutrition/ Microbiology
7	**Program offered the course**	Nutrition Technology Prog.
8	**Instruction Language**	English
9	**Date of course approval**	2022

Brief Description:	This course is a professional experience that introduces the student to the dietary management in hospitals and health centers. This experience can contribute to the student's knowledge, develop skills, and provide awareness of personal and career strengths or limitations. It provides the opportunity to gain a better understanding of the organization, develop a number of professional skills, acquire a greater understanding of the responsibilities of nutritional professionals at the selected organization, and provide opportunities to network with other professionals. Moreover, this experience enables the student to decide whether the organization provides the type of career opportunities the student wants.
Textbooks required for this Course:	• The Internship, Practicum, and Field Placement Handbook by Brian N. Baird. P.D. 6th edition (2010). • Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor. دليل تغذية المرضى في المستشفيات لـ جلال المخللاتي عن: دار الشروق (2004) التغذية العلاجية لمنى خليل عبد القادر الناشر: مجموعة النيل العربية
Course Duration	6 * 28 = 168 teaching hours
Delivery	-Practical Training -Tutorials -Group interaction and discussion -Self-directed activities (Write a detailed report on the practical side) -Laboratory experiments (training in the lab)
Course Objectives:	Upon completion of this course, the student will the ability to: • Obtain a meaningful experience in a profession related to Human Development and dietary.

	• Apply knowledge and theory learned in an academic setting to actual situations in a field-based setting. • Provide feedback regarding the relevance of the university curriculum to the field-based setting. • Develop relationships and interact with experienced professionals. • Develop or enhance professional skills under the simultaneous guidance of a related organization supervisor, and a faculty supervisor.
Course Assessments	Daily Assessments and homework: 20% Lab Report: 50 % Practical Exam in the lab: 30% A 60 % is required for a pass in this course.
Content Breakdown	**Topics Coverage**
Session 1 (Week 1-2)	• **Blood Bank Department** •Learning the safety guidelines followed in blood bank lab • ABO system of different blood groups and how to conduct tests to identify them • Identify Rh blood system
Session 2 (Week 3-4)	• The correct and safe methods for blood transfusion. • Transfusion the main blood components (serum, plasma and cells) to the patient
Session 3 (Week 5-6)	•Conduct of blood transfusion compatibility tests • Cross match •Coombs test (direct & indirect)
Session 4 (Week 7-8)	•Blood donation methods •Anticoagulants in the blood bags •Identifying the reasons that lead to blood cells clogging in the event of an incorrect blood transfusion •Saving blood and blood derivatives correctly
Session 5 (Week 9-11)	•**Clinical Chemistry Department** • Learning the safety guidelines followed in Clinical Chemistry lab. •Identify the correct mechanisms for receiving patient samples in the Department of Clinical Chemistry • Working all types of analyzes for all organs of the body (kidney, liver, heart, etc.)
Session 6 (Week 12-13)	• Practicing the different methods (primitive manual and modern systemic) for conducting medical tests • Ensure the accuracy of the results of blood chemistry tests
Session 7 (Week 14-15)	• Calibrate the used machines in the lab to avoid any possible errors Apply the quality controls for all the tests to achieve reliable results •the implementation of quality control in clinical chemistry lab.
Session 8 (Week 16)	(handing the draft of lab report)
Session 9 (Week 17 -18)	• **Department of Immunology** •Learning the safety guidelines followed in Immunology lab. • Identify the correct mechanisms for receiving patient samples in the Department of immunology

	• Identify the immune response of the body though measuring the WBCs counts.
Session 10 (Week 19)	• Antibody-antigen reactions tests •Serology tests (ASO, RH-factor)
Session 11 (Week20-21)	• Performing practically all the following tests ELISA, Antigen-Antibody interaction, C-reactive protein and Flow cytometry • Identify the dilution methods used in studying the proportion of the amount of foreign bodies in the body.
Session 12 (Week 22-23)	• **Microbiology department** Learning the safety guidelines followed in Microbiology lab. • Identify the different microbes that infect the body • Conducting all tests for biological samples (blood, urine and feces) to detect and classify microbes that infect the body.
Session 13 (Week 24-25)	• Preparation the media for bacterial culture dishes • Learn how to grow and grow bacteria to help diagnose and treat disease
Session 14 (Week 26-27)	• Conducting biochemical distance tests to differentiate between different types of bacteria and fungi • Conduct an antibiotic sensitivity test to be able to choose the appropriate antibiotic to eliminate microbes.
Session 15 (Week 28)	•Isolation the colonies of bacteria from different sources and growing it in different agars. •Learn about the different sterilization methods to avoid infection and the spread of microbes.
Session 16 (Week 29)	**Handling the lab report for assessment**
Attendance Expectations	Students are expected to attend every session of class, arriving on time, returning from breaks promptly and remaining until training is dismissed. Absences are permitted only for medical reasons and must be supported with a doctor's note.
Generic Skills	The faculty is committed to ensuring that students have the full range of knowledge and skills required for full participation in all aspects of their lives, including skills enabling them to be life-long learners. To ensure graduates have this preparation, such generic skills as literacy and numeric, computer, interpersonal communications, and critical thinking skills will be embedded in all courses.
Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as soon as possible. Timetable may also be revised.