



وزارة التعليم العالي والبحث العلمي

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دليل الدراسة لكليات التقنية الطبية  
بالجامعات الليبية

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2022م





**قرار وزير التعليم العالي والبحث العلمي**  
**رقم (١٦٣٩) لسنة 2022 م**  
**بشأن اعتماد دليل الدراسة لكليات التقنية الطبية بالجامعات الليبية**

**وزير التعليم العالي والبحث العلمي:**

- بعد الاطلاع على الإعلان الدستوري المؤقت وتعديلاته.
- وعلى الاتفاق السياسي الليبي الموقع في (17 ديسمبر 2015 ميلادي).
- وعلى القانون رقم (12) لسنة (2010 م) بشأن إصدار قانون علاقات العمل ولائحته التنفيذية.
- وعلى القانون رقم (18) لسنة 2010 م بشأن التعليم.
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**قرار**

**مسادة (1)**

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

**مسادة (2)**

يُعمل بهذا القرار من تاريخ صدوره وعلى الجهات المعنية تنفيذه.

**عمران محمد القيب**  
**وزير التعليم العالي والبحث العلمي**



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



## توطئة

الدول الحريضة 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 وتدریساً لشتى العلوم التقنية الطبية. ولأنها توطئة سنأخذها ونسعى إلى تطبيقها للوصول إلى الجمع بمضمون الدليل بألية متبعة من أجل الهدف وتحقيق الفكرة.

ونحن إذ نقدم هذه الجهود فإننا نأمل أن نكون قد قدمنا شيئاً 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 والعبارة الآتية أينما وردت في هذه اللائحة على المدلولات المبينة 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 وفقاً للقانون رقم (4) للجامعات لسنة 2018م.

**عميد الكلية:** هو المسئول والمشرف على سير العمل بالكلية وتصريف أمورها العلمية والإدارية وفقاً 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 يعادلها 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 للطلاب 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 "محاضرة + 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 الاختصاصيين في مجالات التقنية الطبية وتساهم في دعم وسد النقص في سوق العمل في هذه الاختصاصات بالمرافق الصحية بالقطاعات 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 الآن 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 لتنظم 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 وفقاً 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	قسم المختبرات الطبية	Department of Medical Laboratories
2	قسم الأشعة 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 بناءً 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 يُعدت بأي وثيقة صادرة تخص الطالب ما لم تكن مطابقة لبيانات المنظومة ومعتمدة من الجهة المختصة بإصدارها.

## المادة (7) المشرف الأكاديمي

تكلف الدراسة والامتحانات بالقسم مشرفاً أكاديمياً 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- حصلوا على تقدير ضعيف جداً لسنة دراسية.
  - د- لم ينجزوا الوحدات المقررة في سنتين دراسيتين.
  - هـ- حصلوا أو تجاوزوا الحد الأقصى للإنذارات.
  - و- أنهوا المدة القانونية أربع سنوات ثم خمس سنوات دراسية ثم الحد الأقصى ستة سنوات دراسية أو تجاوزوا عدد مرات الرسوب في المقرر.
  - ح- أي حالات أخرى تستلزم التبليغ أو الإجراء.

## المادة (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 وحلله المواظبة على حضور المحاضرات والدروس العملية المقررة والزيارات الميدانية وإعداد الواجبات والأوراق والتقارير العملية 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.

## المادة (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- المخيمات.

## المادة (10) احتفالات التخرج

تنظم الكلية عقب نهاية كل سنة دراسية حفل تخرج يتم خلاله:

1- توزيع الشهادات وتكريم المتفوقين والتميزين 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 والقيود 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 مستوفياً للشروط العامة التي تحددها التشريعات النافذة للقبول وهي كالتالي:

1. أن يكون حاصلًا 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 والسريية 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 مفضول 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 والعامية 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.

## المادة (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.

## المادة (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 إلكترونياً وذلك حسب السياق المتبع بالكلية أو الجامعة، ولا يعتبر هذا التسجيل رسمياً 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 للطلاب الفرصة لتجديد القيد المتأخر لحالات الغياب المشروع وفق مبرر يقبله مجلس القسم على أن يفي الطالب بالشروط التي يحددها مجلس الكلية، ولا يجوز للطلاب 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 نزيلًا 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 للطلاب تغيير 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 قضاه) 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 (الصفير) 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) المقرر الدراسي

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 عالٍ لإجازة العالمية (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 البحوث 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 سريرية في الأسبوع.  
ب- يكون لكل مقرر مفردات لمحتوياته ويحفظ في القسم المختص ومكتب التسجيل والتوثيق مع نشر نبذة 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

1 <sup>st</sup> 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

ثانياً: قسم المختبرات الطبية

2 <sup>nd</sup> Year Medical Laboratories								
No	Subject	Code	Weekly 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

3 <sup>rd</sup> Year Medical Laboratories								
No	Subject	Code	Weekly 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





4 <sup>th</sup> Year Medical Laboratories								
No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

2 <sup>nd</sup> Year Medical Radiology								
No	Subject	Code	Weekly 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

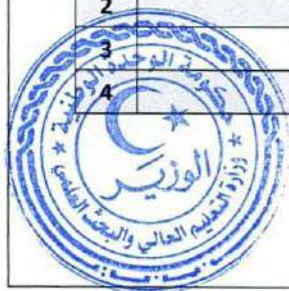




3 <sup>rd</sup> Year Medical Radiology								
No	Subject	Code	Weekly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	2	2	-	2	56
2.	Pathology	MT305	4	3	2	2	3	112
3.	Radiographic Technique II	RD301	4	3	2	2	3	112
4.	Radiation Anatomy (General and 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

4 <sup>th</sup> Year Medical Radiology								
No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

2 <sup>nd</sup> Year Physiotherapy & Rehabilitation								
No	Subject	Code	Weekly 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

3 <sup>rd</sup> Year Physiotherapy & Rehabilitation								
No	Subject	Code	Weekly 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

4 <sup>th</sup> Year Physiotherapy & Rehabilitation								
No	Subject	Code	Weekly 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





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.	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

2 <sup>nd</sup> Year Dental Technology Department								
No	Subject	Code	Weekly 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

3 <sup>rd</sup> Year Dental Technology Department								
No	Subject	Code	Weekly 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





4 <sup>th</sup> Year Dental Technology Department								
No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

2 <sup>nd</sup> Year Anesthesia Technology Department								
No	Subject	Code	Weekly 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

3 <sup>rd</sup> Year Anesthesia Technology Department								
No	Subject	Code	Weekly Hours	Approved Hours	Theoretical Hours	Practical Hours	Credits	Hours/year
1.	Research Methodology	MT301	2	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

#### 4<sup>th</sup> Year Anesthesia Technology Department

No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

#### 2<sup>nd</sup> Year Medical Devices and Equipment

No	Subject	Code	Weekly 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

#### 3<sup>rd</sup> Year Medical Devices and Equipment

No	Subject	Code	Weekly 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

#### 4<sup>th</sup> Year Medical Devices and Equipment

No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

2 <sup>nd</sup> Year Public Health Department								
No	Subject	Code	Weekly 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

3 <sup>rd</sup> Year Public Health Department								
No	Subject	Code	Weekly 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

4 <sup>th</sup> Year Public Health Department								
No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

2 <sup>nd</sup> Year Nutrition Technology Department								
No	Subject	Code	Weekly 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

3 <sup>rd</sup> Year Nutrition Technology Department								
No	Subject	Code	Weekly 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





4 <sup>th</sup> Year Nutrition Technology Department								
No	Subject	Code	Weekly 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	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> 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

### المادة (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) الوسائل التعليمية

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 مستوفياً 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:  
**الامتحان النصف الأول:** يعقد مع بداية شهر يونيو (6) وحتى منتصف شهر يوليو (7) متضمنة تسليم النتائج من انتهاء الدراسة.  
**الامتحان النصف الثاني:** يعقد خلال الأسبوع الثاني والثالث 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 للطلاب النزول 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 أداء الامتحان النهائي للمقرر.





## المادة (42) التقييم والتقدير

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

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

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 موضحاً بالمعادلة.

الدرجة المتحصل عليها بالمادة (س1) × عدد الساعات الدراسية للمادة (س1)

المجموع الكلي للساعات للسنة الدراسية

بالإضافة (+)

الدرجة المتحصل عليها بالمادة (س2) × عدد الساعات الدراسية للمادة (س2)

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

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

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

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

### 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 حاصلًا على معدل عام لا يقل عن 85% ومعدل سنوي لا يقل عن 75% طيلة فترة دراسته.





## المادة (50) طلب المراجعة الموضوعية (الطعون)

يجوز للطلاب التقدم بطلب المراجعة الموضوعية لأوراق إجابته على ألا تزيد عن مقررین 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 مقررین 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 للطلاب 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) تبريراً مكتوباً بالخصوص في النموذج المعد.

## المادة (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 الإجازة 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 للطلاب بدخول الدور الثاني مهما كان عدد المواد التي لم ينجح فيها وترصد للطلاب الناجح بالدور الثاني درجته كاملة.

## المادة (53) الرسوب وإعادة المقرر

يحق للطلاب الراسب في الدور الثاني في أكثر من مقررین 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 للطلاب بترحيل مادتين أو مقررین فقط من سنة دراسية إلى السنة التي تليها ولا يجوز للطلاب 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 إعادة 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 تدريباً عملياً وميدانياً لمدة 24 أسبوعاً (سنة أشهر) وفقاً 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 إنجاز 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 خريجاً 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) وفقاً 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.

### المادة (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- اعتماد 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 أسبوعاً (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 كتابياً 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 جداً في نهاية أي من العامين الدراسيين الأولين.
  - 3) إذا أعيد تنسيبه ورسب سنتين دراسيتين متتاليتين، أياً كان متوسط تقديره العام.
  - 4) إذا تحصل على تقدير عام ضعيف جداً خلال السنة الأولى.
  - 5) إذا رسب في أي مقرر سنتين متتاليتين بدوريتها الأول والثاني.
  - 6) إذا صدر بشأنه قرار فصل من الكلية بناءً 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 بتخرجه 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 لفضي أم جسدياً أم كتابياً 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 عمدية 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 شريكاً 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 مرخصاً بإدخالها من قبل لجنة الامتحانات.
  - 6- الامتناع عن الإداء بالشهادة أمام لجان التحقيق أو مجالس التأديب المشكلة وفقاً لإحكام هذه اللائحة.
  - 7- أية مخالفة للقوانين واللوائح والنظم المتعلقة بالتعليم العالي.
  - 8-

### المادة (65) السلوك المناف للأخلاق العامة

- يعد سلوكاً منافياً 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 وفقاً للقوانين النافذة والمساس بالآداب العامة والأخلاق.

### المادة (66) السلوك المحظور

يعد التعداد الوارد في المواد (64, 65, 66) على سبيل المثال لا الحصر وأي سلوكاً محظوراً آخر يعتبر مخالفاً للتشريعات والنظم المعمول بها في الجامعات والكليات.

## الفصل الثامن: العقوبات التأديبية

### المادة (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.

### المادة (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 وفي جميع الأحوال لا يجوز عودة الطالب لمواصلة الدراسة إلا إذا دفع قيمة الإضرار التي أحدثتها بأموال الجامعة.

### المادة (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 فصلاً نهائياً عند تكرار الأفعال.
3. يعاقب الطالب بالحرمان من دخول الامتحانات كلياً أو جزئياً إذا ارتكب المخالفات المحددة في الفقرتين (3-4)، وفي جميع الأحوال يعتبر امتحانه ملغياً 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 نهائياً 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 أوراقاً 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 ملغياً.



## 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 آخر 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.





وفي حالة التغيب بدون عذر مقبول يصدر المجلس قراره غيابياً، ولا يجوز لمن اشترك في لجنة التحقيق أن يكون عضواً 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 دعاوى الجنائية أو المدنية الناشئة عن الواقعة.

### المادة (84) الطعن في قرارات مجلس التأديب

تعتبر قرارات مجالس التأديب التي تصدر طبقاً 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 1369 ور 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. 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 سارياً مع بداية العام الجامعي التالي.



- ت. يجوز لإدارة الكلية وضع آلية لمتابعة تقييم المناهج والمقررات الدراسية وفقاً 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 جزءاً 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: ...../...../..... م 2022





## المقررات الدراسية

أولاً: 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		<p>التعريف بالمقرر الدراسي وما يتضمنه من مواضيع للتعريف بطبيعة المقرر</p> <p>* الكلام وما يتألف منه.</p> <p>* أقسام الكلمة ومميزات كل قسم منها.</p> <p>* الفعل وأحواله.</p> <p>* همزة الوصل والقطع تعريفها ومواضعها.</p> <p>* علامات الترقيم أشكالها أهميتها واستعمالها.</p> <p>* الكتابة وأنواعها وكيفية كتابة التقرير العلمي.</p> <p>* الحذف والزيادة في الحروف.</p> <p>* التاء المربوطة والتاء المفتوحة.</p> <p>* اللام الشمسية واللام القمرية.</p>
الكتب المقررة		<p>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 توأجدها مصور الكلية. موارد إضافية:</p> <p>1_ لاليء الإملاء محمد مامو 2008م</p> <p>2_ قواعد الإملاء، عبد السلام هارون 1993.</p> <p>3_ قواعد اللغة العربية مبارك مبارك ط3 1992.</p> <p>4_ المرشد في الإملاء والترقيم والتحرير العربي، محمود شاكر سعيد</p> <p>5_ الواضح في النحو وتطبيقاته نادية رمضان النجار ج1، ط1، 2000.</p> <p>6_ ملخص قواعد لغة العربية، فؤاد نعمة، ط19.</p> <p>يمكن استخدام كتب إضافية وبحوث وروابط لمواضيع من الإنترنت وفقا لتقدير استاذ المقرر.</p>
المدة الزمنية للمقرر		28 * 2 = 56 ساعة تدريس
طريقة التدريس		<p>تعتمد الأساليب والطرق المستخدمة في تدريس المقرر على الآتي:</p> <p>عن طريق المحاضرات</p> <p>التدريبات والتمارين</p> <p>حلقات نقاش.</p> <p>ورقات بحثية</p>
الأهداف والمستهدف من المقرر		<p>بدراسة المقرر، سيكون الطالب قد أثبت بشكل موثوق القدرة على أن:</p> <p>1. حفظ لسانه من الخطأ النحوي والاعرابي.</p>





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 نحوياً. 6. يبين التحليل اللغوي في اللغة العربية وطريقة التعبير السليم.	
الامتحان النصفى الأول 10%. الامتحان النصفى الثاني 20%. الواجبات المنزلية + ورقة عمل 10%. الامتحان النهائي 60%. درجة النجاح: 60%	طريقة التقييم
<b>محتوى المقرر الدراسي</b>	<b>محتويات المقرر</b>
المواضيع التي سيتم تغطيتها في الأسبوع • مفهوم اللغة وأهميتها.	الأسبوع (1)
المواضيع التي سيتم تغطيتها في الأسبوع * الكلام وما يتألف منه (الكلام_ الكلم _ القول) * تدريبات	الأسبوع (2)
المواضيع التي سيتم تغطيتها في الأسبوع * الكلمة وأقسامها * مميزات كل قسم (الاسم _ الفعل _ الحرف) * تدريبات	الأسبوع (3,4)
المواضيع التي سيتم تغطيتها في الأسبوع * الجملة وأنواعها. * تدريبات	الأسبوع (5)
المواضيع التي سيتم تغطيتها في الأسبوع * الفعل الصحيح والفعل المعتل. * الفعل المجرد والفعل المزيد. * تدريبات	الأسبوع (6, 7)
المواضيع التي سيتم تغطيتها في الأسبوع * الكتابة أهميتها وأنواعها * الأسلوب أنواعه وخصائصه * تدريبات	الأسبوع (8_9)
المواضيع التي سيتم تغطيتها في الأسبوع * الكتابة الوظيفية(أنواعها) * تدريبات	الأسبوع (10)
المواضيع التي سيتم تغطيتها في الأسبوع * التقرير العلمي (مفهومه _ مكوناته -خطواته ) * كيفية كتابة التقرير العلمي * تدريبات	الأسبوع (11-12)
المواضيع التي سيتم تغطيتها في الأسبوع * علامات الترقيم وأهميتها في الكتابة * تدريبات كتابية	الأسبوع(13)
المواضيع التي سيتم تغطيتها في الأسبوع * اختبار نصف النصفى.	الأسبوع (12)
المواضيع التي سيتم تغطيتها في الأسبوع * التاء المربوطة والتاء المفتوحة. * تدريبات	الأسبوع (13)
المواضيع التي سيتم تغطيتها في الأسبوع * اللام الشمسية واللام القمرية. * تدريبات	الأسبوع (14)



المواضيع التي سيتم تغطيتها في الأسبوع *الهمزة في أول الكلمة (همزة القطع والوصل) *تدريبات	الأسبوع (15)
الامتحان النصفى	الأسبوع (16)
المواضيع التي سيتم تغطيتها في الأسبوع *علامات الإعراب الأصلية والفرعية *تدريبات	الأسبوع (17)
المواضيع التي سيتم تغطيتها في الأسبوع *علامات الإعراب الأصلية والفرعية *تدريبات	الأسبوع (18)
المواضيع التي سيتم تغطيتها في الأسبوع *التحليل اللغوي للنص (نماذج مختارة) *طرق كتابة الهمزة في وسط الكلمة وآخرها *تدريبات	الأسبوع (19،20)
المواضيع التي سيتم تغطيتها في الأسبوع *زيادة الألف بعد واو الجماعة *زيادة ألف تنوين الفتح	الأسبوع (21، 22)
المواضيع التي سيتم تغطيتها في الأسبوع *حذف النون من آخر الكلمة *حذف الياء من آخر الكلمة	الأسبوع (23، 24)
المواضيع التي سيتم تغطيتها في الأسبوع *نماذج للكتابة الوظيفية *تدريبات كتابية	الأسبوع (25، 26)
المواضيع التي سيتم تغطيتها في الأسبوع مراجعة	الأسبوع (27)
المواضيع التي سيتم تغطيتها في الأسبوع مراجعة	الأسبوع (28)
الامتحان النهائي	الأسبوع (29 - 30)
يجب على الطلاب حضور كل المقرر الدراسي في الوقت المحدد ، ولا يسمح بالتغيب إلا لأسباب طبية ويجب دعمه بتقرير طبي.	الحضور والغياب
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.	مهارات عامة
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.	التغيير والتعديل في المقرر الدراسي





## 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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• L. Sophie Tecklin, Jan Stephen, Medical Terminology for Health Professors. Ann Ehrlich, Carol L Schroeder.</li> <li>• Medical Terminology: A Short Course 9th Edition Davi-Ellen Chabner eBook ISBN: 9780323824484, 2022.</li> <li>• Medical Terminology: A Short Course / Edition 8 by Davi-Ellen Chabner BA, MAT ISBN-13: 9780323444927, 2017.</li> <li>• English for Medicine in Higher Education Studies – 2nd Edition Course Book byPatrick Fitzgerald, Marie McCullagh, Ros Wright ISBN: 9781782607625, 2021</li> <li>• English for Medicine in Higher Education Studies Course Book with audio CDs by Patrick Fitzgerald, Marie McCullagh, Ros Wright, Terry Phillips ISBN: 9781859644423, 2010.</li> <li>• English Grammar in Use (R. Murphy; Cambridge University Press)</li> <li>• Exploring Grammar in Writing -- upper-intermediate and advanced (R. Hughes; Cambridge University Press)</li> <li>• Oxford Guide to English Grammar (J. Eastwood; Oxford University Press)</li> <li>• Academic Vocabulary in Use (M. McCarthy and F. O'Dell; Cambridge University Press)</li> <li>• Links to a number of useful grammar websites can be found in the website Using English for Academic Purposes</li> </ul>





	<p>www.uefap.com, maintained by Andy Gillett (from the UEfAP home page, select Links, then Language).</p> <ul style="list-style-type: none"> <li>• <a href="http://www.etymonline.com/abbr.php">http://www.etymonline.com/abbr.php</a></li> <li>• <a href="http://aits.utexas.edu/sites/medterms/esstential-terms/">http://aits.utexas.edu/sites/medterms/esstential-terms/</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	2*28 =56 teaching hours
<b>Delivery</b>	<p>Lecture-based.</p> <p>Group interaction and discussion.</p> <p>self-directed activities.</p> <p>active participation.</p> <p>Laboratory experiments.</p>
<b>Course Objectives:</b>	<p>To Empowering students and helping them to store and memorize the largest possible amount of medical terms used in hospitals and other health facilities.</p> <p>To acquire a general knowledge about medical technology and biomedical sciences lexicon.</p> <p>To give students an introduction to the English terminology of medical and biomedical sciences.</p> <p>To improve students overall use of the language.</p> <p>To master specific vocabulary and idioms.</p> <p>To improve their ability to communicate in English.</p> <p>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.</p> <p>To ease the English learning environment process.</p> <p>To be introduced to a vast number of affixes concerning term of medical technology.</p>
<b>Course Assessments</b>	<p>Mid-term exam 20 %      Activity 10 %      Attendances 10 %</p> <p>Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topical Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to Medical terminology
<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li>• Parts of speech &amp; Tenses (Review).</li> <li>• Prepositions &amp; Usage.</li> </ul>
<b>Session 3 (Week 3)</b>	<ul style="list-style-type: none"> <li>• Conjunctions, Sentence-Linkers &amp; their uses.</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Interchange of Active &amp; Passive Voice.</li> <li>• Direct &amp; Indirect Speech.</li> <li>• Words often confused.</li> </ul>
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• Reading Comprehension.</li> <li>• Selecting &amp; Writing Short Answers.</li> <li>• Summarizing.</li> </ul>





Session 6 (Week 6)	<ul style="list-style-type: none"> <li>• Some Commonly Used Proverbs Of The English Language And Their Explanation.</li> </ul>
Session 7 (Week 7)	<ul style="list-style-type: none"> <li>• Paragraph – Writing.</li> </ul>
Session 8 (Week 8)	<ul style="list-style-type: none"> <li>• General Topics.</li> <li>• Topics Related To Science &amp; Medicine</li> </ul>
Session 9 (Week 9)	<ul style="list-style-type: none"> <li>• Some Proverbs &amp; Their Expansion Into A Paragraph.</li> </ul>
Session 10 (Week 10)	<ul style="list-style-type: none"> <li>• Letter – Writing.</li> <li>• Letter Of Application.</li> <li>• Preparation Of Bio-Data.</li> </ul>
Session 11 (Week 11& 12)	<ul style="list-style-type: none"> <li>• Formation Of Compound Words (Root Words, Prefixes &amp; Suffixes).</li> <li>• Root Words, Prefixes &amp; Suffixes Used In The Medical Field With Special Emphasis On Body Parts &amp; Organs.</li> <li>• Terms Without Clear Root Words.</li> </ul>
Session 12 (Week 13)	<ul style="list-style-type: none"> <li>• Specialists, Specialties &amp; Formation Of Their Adjectives Using Suffixes.</li> <li>• Prefixes &amp; Suffixes Used To Indicate Surgical Procedures.</li> </ul>
Session 13 (Week 14)	<ul style="list-style-type: none"> <li>• Prefixes And Suffixes Used To Indicate Instruments, Machines &amp; Techniques Used In The Diagnostic Field.</li> <li>• The Basis Of Medical Terminology Used</li> </ul>
Session 14 (Week 15)	<ul style="list-style-type: none"> <li>• Commonly Used Medical Abbreviations.</li> <li>• The Relationship Of Medical Terminology To Hospital Management</li> </ul>
Session 15 (Week 16)	<ul style="list-style-type: none"> <li>• Understand The Basic Health Terminology Used</li> <li>• Terminology Of Some Common Diseases &amp; Conditions.</li> </ul>
Session 16 (Week 17)	<b>Midterm Exam</b>
Session 17 (Week 18)	<ul style="list-style-type: none"> <li>• Knowing The Basis Of Compound Terms</li> <li>• Knowing The Basis Of The Parts And Functions Of The Various</li> </ul>
Session 18 (Week 19)	<ul style="list-style-type: none"> <li>• Organs of The Body</li> <li>• Medical Abbreviations</li> </ul>
Session 19 (Week 20)	<ul style="list-style-type: none"> <li>• Laboratory Acronyms</li> <li>• Diagnostic Acronyms</li> </ul>
Session 20 (Week 21)	<ul style="list-style-type: none"> <li>• Reflex Activity Testing</li> <li>• Cerebral Palsy</li> </ul>
Session 21 (Week 22)	<ul style="list-style-type: none"> <li>• Muscular</li> <li>• Torticollis</li> </ul>
Session 22 (Week 23)	<ul style="list-style-type: none"> <li>• Clubfoot</li> <li>• Deformities</li> </ul>
Session 23 (Week 24)	<ul style="list-style-type: none"> <li>• Developmental</li> <li>• Dysplasia Of The Hip</li> </ul>
Session 24 (Week 25)	<ul style="list-style-type: none"> <li>• Spina Bifida</li> <li>• Muscular</li> </ul>
Session 25 (Week 26)	<ul style="list-style-type: none"> <li>• Dystrophy</li> <li>• Duchenne Muscular Dystrophy</li> </ul>
Session 26 (Week 27)	<ul style="list-style-type: none"> <li>• Down Syndromes</li> <li>• Congenital Abnormalities</li> </ul>





Session 27 (Week 28)	Final Exam
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>Fundamentals of Computing and Programming 2010.</li> <li>Computer Applications: The Beginner's Guide by Michael Edefe 2020, ISBN-13 : 979-8563103450.</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		(3*28 = 84 teaching hours)
<b>Delivery</b>		<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem based learning</li> </ul>





<b>Course Objectives:</b>	<ul style="list-style-type: none"> <li>• Class discussion.</li> <li>• Learn the basics of computer science and its physical parts and their functions.</li> <li>• Learn about computer networks and security systems.</li> <li>• Getting acquainted with one of the useful applied programs in the field of specialization and training on it in practice.</li> <li>• Work effectively with a range of current, standard, Office Productivity software applications.</li> <li>• Evaluate, select and use office productivity software appropriate to a given situation.</li> <li>• Apply basic adult learning and assessment principles in the design, development, and presentation of material produced by office productivity applications.</li> <li>• Demonstrate employability skills and a commitment to professionalism.</li> <li>• Operate a variety of advanced spreadsheet, operating system and word processing functions.</li> <li>• Solve a range of problems using office productivity applications, and adapt quickly to new software releases.</li> <li>• Maintain quality assurance through critically evaluating procedures and results.</li> </ul>
<b>Course Assessments</b>	Activities 10%      Midterm exam 20 %      Attendances 10%      Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topical Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction and history of computer sciences
<b>Session 2 (Week 2)</b>	Computer definition, advantages, disadvantages, main computer parts.
<b>Session 3 (Week 3)</b>	Operating systems, application software, and programming languages
<b>Session 4 (Week 6 -7)</b>	Algorithms, types and classifications of programming language
<b>Session5 (Week 8 - 10)</b>	Basic concepts of computer networks, and the physical parts of networks
<b>Session6 (Week 11)</b>	Basic concepts of information security
<b>Session 7 (Week 12 -13)</b>	Windows Principles
<b>Session 8(Week 14 -16)</b>	Working with M-office: Practical lessons on Word
<b>Session 10(Week 16-18)</b>	Practical lessons on Power Point
<b>Session 11(Week 19)</b>	<b>Med term exam</b>
<b>Session 12(Week20-21)</b>	Practical lessons on M-office Exce
<b>Session13(Week 22-25)</b>	Internet and e-mail. (classroom, drive, meeting).
<b>Session 14 (Week 26)</b>	The relationship of the computer and its applications in the field of medicine and health care
<b>Session 15 (Week 27)</b>	The use of computers in medicine ( its advantages and disadvantages).
<b>Session 16 (Week 28)</b>	Samples of modern and advanced medical devices
<b>Session17 (Week29)</b>	Revision and discussion
<b>Session18(Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Physics
2	<b>Course Code</b>	MT104
3	<b>Course type: /general/specialty/optional</b>	general
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Non
7	<b>Program offered the course</b>	Program hired Instructor
8	<b>Instruction Language</b>	English language
9	<b>Date of course approval</b>	2022

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Essential Physics, John Ball <i>et al.</i> Third edition</li> <li>• General Physics for Medical Sciences Students By Dr. Hasan Maridi</li> <li>• Lecture notes for General Physics 219 Martin Kruczenski Department of Physics, Purdue University, 525 Northwestern Avenue, W. Lafayette, IN 47907-2036.</li> <li>• <a href="https://physics.uwo.ca/~tpoeppin/documents/Phys2600_MedPhys_Syllabus_2009.pdf">https://physics.uwo.ca/~tpoeppin/documents/Phys2600_MedPhys_Syllabus_2009.pdf</a></li> <li>• <a href="https://web.ics.purdue.edu/~markru/courses/PHY219/Phys_219_notes.pdf">https://web.ics.purdue.edu/~markru/courses/PHY219/Phys_219_notes.pdf</a></li> </ul>





	<ul style="list-style-type: none"> <li>Physics of the Human Body (Biological and Medical Physics, Biomedical Engineering)</li> <li><a href="file:///C:/Users/BMI/Downloads/Physics%20of%20the%20Human%20Body%20(Biological%20and%20Medical%20Physics,%20Biomedical%20Engineering)%20(%20OPDFDrive%20).pdf">file:///C:/Users/BMI/Downloads/Physics%20of%20the%20Human%20Body%20(Biological%20and%20Medical%20Physics,%20Biomedical%20Engineering)%20(%20OPDFDrive%20).pdf</a></li> <li>Intermediate Physics for Medicine and Biology, 4th Edition (Biological and Medical Physics: Biomedical) by <a href="#">Russell K. Hobbie</a> &amp; <a href="#">Bradley J. Roth</a> 2007</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>						
<b>Course Duration</b>	4 * 28 = 112 teaching hours						
<b>Delivery</b>	Lectures, Problem solving and homework ,Tutorials Class discussion, Lab experiments ,Practical Demonstrations						
<b>Course Objectives:</b>	<p>Upon successful completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>Understand the basics of general and medical physics</li> <li>Describe the importance of physics in pharmacy and medical technology.</li> <li>Compare and contrast the medical imaging techniques that are available in <ul style="list-style-type: none"> <li>a hospital setting and explain their relative merits</li> </ul> </li> <li>Describe sensing and therapeutic applications of physics in medical technology.</li> <li>Understand the following: <ul style="list-style-type: none"> <li>Mathematic units, relation of physics with the biological sciences.</li> <li>Biomechanics.</li> <li>Liquids.</li> <li>Dynamics of fluids.</li> <li>Bioelectricity.</li> </ul> </li> </ul> <p>External senses</p>						
<b>Course Assessments</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Activities 10%</td> <td style="width: 33%;">Midterm exam 20 %</td> <td style="width: 33%;">Attendances</td> </tr> <tr> <td>10%</td> <td>Final Exam 60%</td> <td></td> </tr> </table> <p>A 60% is required for a pass in this course.</p>	Activities 10%	Midterm exam 20 %	Attendances	10%	Final Exam 60%	
Activities 10%	Midterm exam 20 %	Attendances					
10%	Final Exam 60%						
<b>Content Breakdown</b>	<b>Topics Coverage</b>						
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>Introduction to physics</li> </ul>						
<b>Session 2 (Week 2, 3&amp; 4)</b>	<input type="checkbox"/> Measurements <ul style="list-style-type: none"> <li>Measuring things</li> <li>Three basic units: Length, Mass, Time</li> <li>SI units</li> <li>Unit conversion</li> <li>Dimension</li> </ul>						
<b>Session 3 (Week 5&amp; 6)</b>	<input type="checkbox"/> Vectors <ul style="list-style-type: none"> <li>Vectors and scalars</li> <li>Describe vectors geometrically</li> <li>Components of vectors</li> <li>Unit vectors</li> </ul>						





	Vectors addition and subtraction
Session 4 (Week 7, 8 & 9)	<input type="checkbox"/> <b>Mechanical</b> <ul style="list-style-type: none"> <li>• Movement in one dimension: speed, acceleration, and free fall</li> <li>• 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.</li> <li>• Work and Energy: Work exerted by a constant force, kinetic energy and potential energy</li> </ul>
Session 6 (Week 10)	<ul style="list-style-type: none"> <li>• Density</li> </ul>
Session 7 (Week 11)	<ul style="list-style-type: none"> <li>• Pressure, Pressure in fluids, atmospheric pressure, Pascal's rule and Archimedes' rule</li> </ul>
Session 7 (Week 12)	<ul style="list-style-type: none"> <li>• Surface tension and pressure difference in bubbles capillary property</li> </ul>
Session 7 (Week 13)	<ul style="list-style-type: none"> <li>• Viscosity</li> </ul>
Session 7 (Week 14)	<ul style="list-style-type: none"> <li>• Fluids in motion - Continuity equation - Bernoulli equation - Applications to Bernoulli's equation</li> </ul>
Session 7 (Week 15)	<ul style="list-style-type: none"> <li>• Flexibility, stress, types of stress (tensile), compression, Young's modulus</li> </ul>
Session 7 (Week 16)	<b>Med term Exam</b>
Session 7 (Week 17)	<b>Temperature and thermal expansion</b> <ul style="list-style-type: none"> <li>• Heat, temperature and thermal equilibrium</li> <li>• Temperature scales (Celsius, Fahrenheit, Kelvin)</li> <li>• Thermal expansion (longitudinal expansion, surface expansion, volumetric expansion)</li> </ul>
Session 7 (Week 18)	<input type="checkbox"/> <b>The amount of thermal drift</b> <ul style="list-style-type: none"> <li>▪ Heat capacity and heat specificity</li> <li>▪ amount of energy, phase change, latent heat</li> <li>▪ retention of energy.</li> </ul>
Session 7 (Week 19)	<input type="checkbox"/> <b>Transfer of thermal energy</b> <ul style="list-style-type: none"> <li>▪ Conductive heat transfer</li> <li>▪ Conductive heat transfer</li> <li>▪ Convection radiant heat transfer</li> </ul>
Session 7 (Week 20)	<input type="checkbox"/> <b>Wave classification:</b> <ul style="list-style-type: none"> <li>• Mechanical transverse and longitudinal, simple non-mechanical harmonic motion, harmonic oscillator, transverse wave propagation, harmonic waves and standing waves.</li> </ul>
Session 7 (Week 21)	<input type="checkbox"/> <b>Sound</b> <ul style="list-style-type: none"> <li>• 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.</li> </ul>
Session 7 (Week 22)	<input type="checkbox"/> <b>The light</b> <ul style="list-style-type: none"> <li>• 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.</li> </ul>
Session 7 (Week 23)	<input type="checkbox"/> <b>Reflection and refraction</b>





	<ul style="list-style-type: none"> <li>• Reflection from a plane, principle of rays, reflection from a spherical surface, refraction through planar and spherical surfaces, thin lenses, lens equation.</li> </ul>
Session 7 (Week 24)	<input type="checkbox"/> <b>Optics</b> <ul style="list-style-type: none"> <li>• Interferometry: Definition of Interferometry</li> <li>• Diffraction</li> </ul>
Session 7 (Week 25)	<input type="checkbox"/> <b>X-ray</b> <ul style="list-style-type: none"> <li>• Definition, Its properties, production, x-rays in medicine</li> </ul>
Session 7 (Week 26)	<input type="checkbox"/> <b>Lasers:</b> <ul style="list-style-type: none"> <li>• An Introduction to Laser Discovery</li> </ul>
Session 7 (Week 27, 28 & 29)	<ul style="list-style-type: none"> <li>• The structure of the atom</li> <li>• Isotopes</li> <li>• Nuclear Stability</li> <li>• Types of Radiation</li> <li>• Half-lives</li> </ul>
Session 16 (Week 30)	<b>Final Exam</b>
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:		<p>The course will provide the student with a fundamentals 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.</p> <p><b>General chemistry/</b> 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.</p> <p><b>Practical chemistry/</b> identification of acid radical (anion) in sample salts and identification of basic radical (cation) in sample salts.</p>
Textbooks required for this Course:		<ul style="list-style-type: none"> <li>Organic Chemistry by Morrison and Boyd, fifth edition</li> <li>Chemical Principles by William L. Masterton.; Emil J. Slowinski.; Conrad L. Stanitski.; Fifth Edition</li> <li>Wilson &amp; Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry by John Block &amp; John M. Beale, eleventh edition.</li> <li><a href="https://www.durhamtech.edu/sites/default/files/course_outlines/CHM251_0.pdf">https://www.durhamtech.edu/sites/default/files/course_outlines/CHM251_0.pdf</a></li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul> <p>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.</p>
Course Duration		4*28 = 112 teaching hours
Delivery		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
Course Objectives:		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>Demonstrate an understanding of basic principles of general and organic chemistry and how they relate to everyday experiences.</li> </ul>





	<ul style="list-style-type: none"> <li>• Demonstrate the laboratory study of the physical and chemical properties of matter; the principles and applications of gravimetric, volumetric, chemical, and quantitative analysis</li> <li>• Gain the basic knowledge about atomic structure, periodic table, chemical equations, gases, liquids, solids, electrolysis, properties of elements and compounds, rates and mechanisms of reactions</li> <li>• Identify all kinds of chemical compounds, its formula and rename it and understand chemical calculation.</li> <li>• Identification of acid radical (anion) and basic radical (cation) in sample salts</li> <li>• Demonstrate problem solving and critical thinking skills</li> <li>• Apply methods of scientific inquiry.</li> <li>• Apply problem solving techniques to real-world problems.</li> <li>• Demonstrate an understanding of the chemical environment and the role that organic molecules play in the natural and the synthetic world</li> <li>• 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</li> <li>• Understand chemical bonding, hybrid orbitals, molecular geometry, bond energies, polarity, the relationship between structure and physical properties, and acid/base theories.</li> <li>• Recognize, draw and identify examples of each of the major functional groups and classes of organic compounds</li> </ul>
Course Assessments	Activities 10%      Midterm exam 20 %      Attendances 10% Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
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)
<b>Session 7 (Week7)</b>	-Quantum numbers - periodic table -Identification of acid radical (anion) in sample salts: Group HCl dilute, (sulphite)
<b>Session 8 (Week 8)</b>	-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)
<b>Session 9 (Week 9)</b>	-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)
<b>Session 10 (Week 10)</b>	-Atoms and molecules, a review -Electron structure of the atom -Identification of acid radical (anion) in sample salts: Group HCl dilute, (nitrites)
<b>Session11(Week11)</b>	-Atomic orbitals -Filling the orbitals -Aufbau principle -Identification of acid radical (anion) in sample salts: Group sulphuric acid cons, (chlorides)
<b>Session 12 (Week12)</b>	-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)
<b>Session13(Week13)</b>	-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)
<b>Session 14 (Week 14)</b>	-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)
<b>Session15 (Week15)</b>	<b>Midterm Exam</b>
<b>Session16 (Week16)</b>	-Attraction between molecules: -Dipole – dipole interactions





	<ul style="list-style-type: none"> <li>-Van der Waals forces</li> <li>-Hydrogen bonding</li> <li>-Effects of hydrogen bonding</li> <li>- Identification of acid radical (anion) in sample salts: Group miscellaneous, (sulphates)</li> <li>-Identification of acid radical (anion) in sample salts: Group miscellaneous, (phosphates)</li> </ul>
<b>Session17 (Week17)</b>	<ul style="list-style-type: none"> <li>-Orbitals and their role in covalent bonding, hybridization:</li> <li>-Bonding in hydrogen</li> <li>-The sigma bond</li> <li>-Some general features of bonding and anti-bonding of orbitals</li> <li>-Hybrid orbitals of carbon:</li> <li>-Sp<sup>3</sup> hybridization</li> <li>-Identification of basic radical (cation) in sample salts: Group (1)</li> </ul>
<b>Session18 (Week18)</b>	<ul style="list-style-type: none"> <li>-Sp<sup>2</sup> hybridization</li> <li>-Sp<sup>2</sup> hybridization</li> <li>-Identification of basic radical (cation) in sample salts: Group (2A)</li> </ul>
<b>Session19 (Week19)</b>	<ul style="list-style-type: none"> <li>-Sp hybridization</li> <li>-Effect of hybridization on bond lengths</li> <li>-Identification of basic radical (cation) in sample salts: Group (2B)</li> </ul>
<b>Session20 (Week20)</b>	<ul style="list-style-type: none"> <li>-Functional groups</li> <li>-Carbonyl compounds</li> <li>-Identification of basic radical (cation) in sample salts: Group (3)</li> </ul>
<b>Session21 (Week21)</b>	<ul style="list-style-type: none"> <li>-Structural isomerism, nomenclature, and alkane</li> <li>-Structural isomers</li> <li>-How organic nomenclature developed</li> <li>-A survey of organic nomenclature</li> <li>-Continuous- chain alkanes</li> <li>-Cycloalkanes-side chains or branch</li> <li>-Branched side chains</li> <li>-Multiple branches</li> <li>-Other prefix substituents</li> <li>-Identification of basic radical (cation) in sample salts: Group (4)</li> </ul>
<b>Session22 (Week22)</b>	<ul style="list-style-type: none"> <li>-Nomenclature:</li> <li>-Alkenes and alkynes, alcohols and amines, aldehydes and ketones</li> <li>-Carboxylic acids, esters, and benzene compounds</li> <li>-Conflicts in numbering</li> <li>Alkanes:</li> <li>-Physical properties of alkanes</li> <li>-Chemical properties of alkanes</li> <li>-Halogenation and combustion</li> <li>-The hydrocarbon resources</li> <li>-Identification of basic radical (cation) in sample salts: Group (5)</li> </ul>
<b>Session23 (Week23)</b>	<ul style="list-style-type: none"> <li>Stereochemistry</li> <li>-Geometric isomers</li> <li>-Conformations of molecules</li> </ul>





	<ul style="list-style-type: none"> <li>-Geometric isomerism in alkenes</li> <li>-Geometric isomerism in cyclic compounds</li> <li>-Conformations of open-chain compounds</li> <li>-Identification of basic radical (cation) in sample salts: Group (6)</li> </ul>
<b>Session24 (Week24)</b>	<ul style="list-style-type: none"> <li>-Alkenes and alkynes</li> <li>-Bonding in alkenes and alkyne, acidity of alkynes</li> <li>-Nomenclature of alkenes and alkynes: IUPAC and trivial names</li> <li>-Physical properties of alkenes and alkynes</li> <li>-Preparation of alkenes and alkynes</li> <li>-Preparation of alkenes from primary alkyl halides</li> <li>-Preparation of alkenes from secondary alkyl halides</li> <li>-Preparation of alkenes from tertiary alkyl halides</li> <li>-Preparation of alkynes from the elongation reaction of shorter chain alkynes</li> <li>-Preview of addition reaction</li> <li>-Addition of hydrogen halides to alkenes and alkynes</li> <li>Markonikov's rule</li> </ul>
<b>Session25 (Week25)</b>	<ul style="list-style-type: none"> <li>-Alcohols, ethers and related compounds</li> <li>-Physical properties of alcohols and ethers</li> <li>-Boiling points</li> <li>-Solubility in water</li> <li>-Nomenclature of alcohols:</li> <li>-IUPAC names of alcohols</li> <li>-Trivial names of alcohols</li> <li>-Classification of alcohols</li> </ul>
<b>Session26 (Week26)</b>	<ul style="list-style-type: none"> <li>-Nomenclature of ethers</li> <li>-IUPAC names of ethers</li> <li>-Trivial names of ethers</li> <li>-Preparation of alcohols</li> <li>-Nucleophilic substitution reaction</li> <li>-Reduction of carbonyl compounds</li> <li>-Laboratory oxidation of alcohols</li> <li>-Preparation of ethers</li> <li>-Williamson ether synthesis</li> <li>-Use of alcohols and ethers in synthesis</li> </ul>
<b>Session27 (Week27)</b>	<ul style="list-style-type: none"> <li>Aldehyde and ketones</li> <li>-Nomenclature of aldehydes and ketones (IUPAC and trivial names)</li> <li>-Preparation of aldehydes by: oxidation primary alcohols</li> <li>-Preparation of ketones by: oxidation secondary alcohols and by Friedal-Crafts acylation reaction</li> <li>-The carbonyl group</li> <li>-Physical properties of aldehydes and ketones: boiling point and solubility in H<sub>2</sub>O</li> <li>-Addition of reagents to the carbonyl group</li> <li>Reactivity of aldehydes and ketones</li> </ul>
<b>Session28 (Week28)</b>	<ul style="list-style-type: none"> <li>-Carboxylic acids: IUPAC names and trivial names</li> <li>-Physical properties of some carboxylic acids: Boiling points and solubility</li> </ul>
<b>Session29 (Week29)</b>	<ul style="list-style-type: none"> <li>-Preparation of carboxylic acids:</li> <li>-Hydrolysis of the derivatives of the carboxylic acids</li> <li>-Oxidation of primary alcohols and aldehydes</li> </ul>





(Week29)	Revision and discussion with students (answering questions )
Session 28 (Week 30)	<b>Final Exam</b>
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:		<p>This course covers the principles of biology. It also gives general information about human body,</p> <p>It also covers the laboratory safety issues and the important precautions needed to be taken before, during, and after finishing the laboratory work.</p> <p>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.</p>
Textbooks required for this Course:		<ul style="list-style-type: none"> <li>• Integrated principle of Zoology. ELEVENTH EDITION, WILLIAM C. OBER, M.D. and CLAIRE W. GARRISON, R.N.</li> <li>• Richard Dawkins3 zoologist and biology popularizer</li> <li>• General Biology by Paul Doerder, Ralph Gibson 2015</li> <li>• General Biology by Paul Doerder, et al,2013</li> </ul>









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)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Biostatistics with R an Introductory Guide for Field Biologists Jan Lepš 2020</li> <li>• Introductory Biological Statistics, Third Edition Raymond E. Hampton, John E. Havel 2018</li> <li>• <a href="https://books.google.com.ly/books?id=RzpFKbU62u4C&amp;printsec=frontcover&amp;hl=ar&amp;source=gbs_ge_summary_r&amp;cad=0#v=onepage&amp;q&amp;f=false">https://books.google.com.ly/books?id=RzpFKbU62u4C&amp;printsec=frontcover&amp;hl=ar&amp;source=gbs_ge_summary_r&amp;cad=0#v=onepage&amp;q&amp;f=false</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul> <p style="text-align: right;">• الاحصاء والاحتمالات بين النظرية والتطبيق موارد إضافية: يمكن استخدام كتب اضافية وبحوث وروابط لمواضيع من الإنترنت وفقا لتقدير استاذ المقرر</p>
<b>Course Duration</b>		2 * 28 = 56 teaching hours
<b>Delivery</b>		Lecture, group interaction and discussion, self-directed actives.
<b>Course Objectives:</b>		<p><b>Upon completion of this course, the student will have reliably demonstrated the ability to:</b></p> <ul style="list-style-type: none"> <li>• Enable the student to know the importance of statistics and its relationship to other sciences</li> <li>• To develop basic statistical analysis skills required in sciences and research.</li> <li>• Acquiring the basic knowledge and understanding biostatistics and different type of statistical distribution.</li> <li>• Gaining the required skills to compare between different statistical tests and applying the most suitable statistical test related to the problem under study.</li> <li>• To enable the students to identify the measures of dispersion and identify the methods of calculating the correlation coefficient and regression</li> <li>• understand random variables and their probability distributions</li> </ul>
<b>Course Assessments</b>		Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>		<b>Topics Coverage</b>





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)	<b>Midterm Exam</b>
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 $\chi^2$ test for independence. • Review for lectures
(Week29)	Revision and discussion with students (answering questions )
Session 28 (Week 30)	<b>Final Exam</b>
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.





<b>Course Change</b>	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.
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### First Aid and Occupational Safety

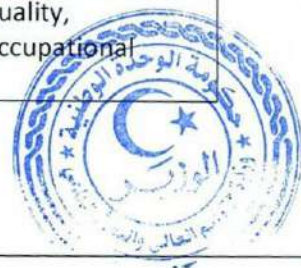
1	<b>Course name</b>	First Aid and Occupational Safety
2	<b>Course Code</b>	MT108
3	<b>Course type: /general/specialty/optional</b>	General
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Non
7	<b>Program offered the course</b>	Program hired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

<b>Brief Description:</b>	<p>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.</p> <p>It also covers the laboratory safety issues and the important precautions needed to be taken before, during, and after finishing the laboratory work.</p> <p>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.</p>
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• First aid prepared by Ala'a Aqil Khadder, Publisher Arab community library for publishing of Distribution, 2012.</li> <li>• First Aid, CPR, and AED: Standard - 7th edition by AAOS</li> <li>• Handbook of Occupational Safety and Health, Third Edition 2019 Editor(s):S. Z. Mansdor</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture, group interaction and discussion, self-directed actives.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ol style="list-style-type: none"> <li>1- Distinguish the types of injuries and how to deal with them.</li> <li>2- Describe disease or injury to person.</li> <li>3- Explain the procedures, operations and treatments to save the injured person.</li> <li>4- Determine through symptoms and sings the appropriate diagnosis for the condition.</li> </ol>





	<p>5- Understand the framework of the Health and Safety at Work etc, and the employers', employees' and visitors' duties.</p> <p>6- Evaluate hazards and risks in order to carry out a risk assessment.</p> <p>7- Understand the legal requirements to report any accident or dangerous occurrence.</p> <p>8- Develop risk assessments for scientific laboratories that use chemicals or biological organisms or both.</p> <p>9- State the various controls that protect laboratory personnel, including engineering, administrative, work practices, and personal protective equipment.</p>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam 20 %</p> <p>Attendances 10%                  Final Exam        60%</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to emergency care (definition of first aid, equipment and supplies, and procedures of first aid).
<b>Session 2 (Week 2)</b>	Patient assessment (primary survey, secondary survey for patient trauma, and baseline vital sings).
<b>Session 3 (Week 3&amp;4)</b>	The air way (oxygen sources, equipment for oxygen delivery, masks, air way accessories, and suction). Recovery position (definition, purpose, principles, and methods).
<b>Session 4 (Week 5)</b>	Care of respiratory system and Care of heart function
<b>Session 5 (Week 6&amp;7)</b>	Disorders of cardiovascular system (shock, coma, angina, heart crisis, and stroke).
<b>Session 6 (Week 8&amp;9)</b>	Disorder of respiratory system (asphyxia, choking, drowning, inhalation of fumes, and asthma).
<b>Session 7 (Week10)</b>	Loss of consciousness (definition, causes, signs and symptoms, and aid and treatment).
<b>Session 8 (Week 11)</b>	Bleeding (definition, classification, type of bleeding, emergency care or aid and treatment).
<b>Session 9 (Week 12)</b>	Soft tissue injuries (wounds), definition, types, and emergency care.
<b>Session 10 (Week 13&amp;14)</b>	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).
<b>Session 11 (Week 15)</b>	<b>Med term Exam</b>
<b>Session12(Week16&amp;17)</b>	Burns (introduction about skin, definition, source of burns, classification, and general complication of burns, aid of burns, and aid of simple and major burns).
<b>Session 13 (Week18&amp;19&amp;20)</b>	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.
<b>Session14(Week21&amp; 22&amp;23)</b>	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.
<b>Session 15 (Week 24&amp;25)</b>	Occupational risk for radiologist. Radiology safety equipment and essential safety equipment for all types of radiology departments.
<b>Session 16 (Week26&amp;27)</b>	Laboratory safety (introduction, general laboratory safety rules, and basic laboratory safety rules).
<b>Session17(Week28&amp;29)</b>	Wastes, waste types, and universal wastes. Disposal, handling, and storing of wastes Waste labeling, recycling and disposal guidelines,
<b>Session 18 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	The course is designed to enable the student to understand the components and basic electrical circuits behind the construction of medical instruments
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>* Biomedical engineering Handbook: second editions ED. Joseph D. Bronzino Boca Ration: CRC Press LLC: 2000.</li> <li>*J. W. Nilsson and S. Riedel, Electric Circuits, 11th Edition, 2018, Pearson, ISBN13: 978-0134746968.</li> <li>* Stuart Porter, Fourteenth Edition 2011, Churchill Living stone , Tidy's physiotherapy</li> <li>* Physics and Instrumentation of Diagnostic Medical Ultrasound, Peter Fish</li> <li>* Essential Physics for Radiographers, John Ball, Adrian D. Moore, Third Edition</li> <li>* Introduction To Biomedical Equipment Technology, Fourth Edition; Joseph J. Carr, John M. Brown. 2001 by Prentice-Hall, Inc.</li> <li>* Principles of Biomedical Instrumentation and Measurement. R. Aston; Merrill.</li> <li>* Applied Clinical Engineering. B. Feinberg; Prentice-Hall, Inc.</li> <li>* Introduction to Biomedical Electronics. J. Dubovy; McGraw-Hill.</li> <li>*Principles of Applied Biomedical Instrumentation. L. Geddes and L. Baker; John Wiley.</li> <li>*Textbook of Medical Physiology. A. Guyton; Saunders.</li> <li>*Essentials of Physiology. J. Lamb et al; Blackwell.</li> <li>*Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor.</li> </ul> <p><a href="http://www.bmes.org/">http://www.bmes.org/</a></p> <p><a href="http://arjournals.annualreviews.org/loi/bioeng?cookieSet=1">http://arjournals.annualreviews.org/loi/bioeng?cookieSet=1</a></p> <p><a href="http://www.aami.org/publications/BIT/index.html">http://www.aami.org/publications/BIT/index.html</a></p>





	<a href="http://www.biophysj.org/">http://www.biophysj.org/</a> <a href="http://emb-magazine.bme.uconn.edu/">http://emb-magazine.bme.uconn.edu/</a> <a href="http://emb-magazine.bme.uconn.edu/">http://emb-magazine.bme.uconn.edu/</a> <a href="http://www.iee.org/Publish/Journals/ProfJourn/MBEC/">http://www.iee.org/Publish/Journals/ProfJourn/MBEC/</a> <a href="http://spie.org/app/Publications/index.cfm?fuseaction=journals&amp;type=jbo">http://spie.org/app/Publications/index.cfm?fuseaction=journals&amp;type=jbo</a> <a href="http://www.biomedical-engineering-online.com/start.asp">http://www.biomedical-engineering-online.com/start.asp</a>
Course Duration	4 * 28 = 112 teaching hours
Delivery	Lectures, Problem based learning, Tutorials Class discussion, Practical Demonstrations
Course Objectives:	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> <li>• Acquaint basic design concepts essential to the understanding of biomedical engineering.</li> <li>• Describe the types of research studies and biostatistical parameters used in investigating medical instruments and therapy.</li> <li>• Describe the generalized static and dynamic characteristics of instrument performance.</li> <li>• Understand the different problem types and problem solving approaches in engineering, biology, and medicine.</li> <li>• Appreciate the applications and limitations of instrumentation in clinical environments</li> <li>• Uses and maintenances od medical devices</li> </ul>
Course Assessments	Midterm exam 20 %    Activity 10 %    Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
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)	<b>Midterm Exam</b>





<b>Session 12(Week15 -16)</b>	Physiological Measurement Devices (in vivo diagnosis) Blood Pressure and Sound blood pressure monitors and Thermometers
<b>Session 13(Week 17)</b>	Respiratory physiology device ✓ Pulse Oximetry Spirometers
<b>Session 14(Week 18)</b>	Cardiac and Other Diagnostic Equipment's like ( EEG,EMG Etc) Patient Monitoring devices O.T Equipment's
<b>Session 15 (Week 19)</b>	Dialysis equipment's
<b>Session 16 (Week 20-21)</b>	Basic of Laboratory medical device ✓ Microscopy ✓ centrifugation spectrophotometers, water baths, incubators, ovens, scales and CBC system .....etc
<b>Session 17(Week 22-23)</b>	Basic of Anesthesia and critical care related instrumentations
<b>Session18(Week 24-25)</b>	Basic of Dental technology equipment's
<b>Session 19(Week 26-27)</b>	Basic of Rehabilitation and Physiotherapy instrumentations
<b>Session 20(Week 28-29)</b>	Basic of Radiological and imaging instruments <ul style="list-style-type: none"> <li>• Diagnostic equipment's</li> <li>• Therapeutic Equipment's</li> </ul>
<b>Session 20(Week 30-31)</b>	Disposal of medical Equipment's Provision of Maintenance Types of medical equipment's Maintenance
<b>Session 21 (Week 32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Essentials of Human Anatomy &amp; Physiology by Elaine Marieb 10th Edition or later (recommended).</li> <li>• Human Anatomy &amp; Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn.</li> <li>• Introduction to the Human Body, 10th Edition</li> <li>• Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> </ul>
<b>Course Duration</b>	4* 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Describe the major cavities of the body and the organs they contain.</li> </ul>





	<ul style="list-style-type: none"> <li>• Explain what a cell is? and explain how human organs and systems interact.</li> <li>• Describe the major functions of the four types of human tissue.</li> <li>• List the major systems of the body, the organs they contain and the functions of those systems.</li> <li>• Define the terms anatomy and physiology.</li> <li>• Define homeostasis.</li> <li>• Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1-2)</b>	<ul style="list-style-type: none"> <li>• Introduction to Anatomy</li> <li>• Levels of organization</li> <li>• Body regions, planes, and orientations and body cavities</li> </ul>
<b>Session 2 (Week 3-4)</b>	<ul style="list-style-type: none"> <li>• Skeletal system</li> <li>• Bone structure and types, cartilage, ligaments, tendons, and joints</li> <li>• Axial and appendicular skeletons</li> <li>• Scientific terminologies of the main body bones</li> </ul>
<b>Session 3 (Week 5-6)</b>	<ul style="list-style-type: none"> <li>• Muscular system</li> <li>• Types of muscles, Differences and their microscopic structure</li> <li>• Skeletal muscle structure and neuromuscular junction</li> <li>• Scientific terminologies of the main body Muscles</li> </ul>
<b>Session 4 (Week 7-9)</b>	<ul style="list-style-type: none"> <li>• Cardiovascular (Circulatory) system</li> <li>• Components of cardiovascular system and types of circulations</li> <li>• The heart, arteries, veins, capillaries, and lymphatic vessels</li> <li>• The blood components (plasma and blood cells)</li> <li>• Scientific terminologies of the main cardiovascular components</li> </ul>
<b>Session 5 (Week 10-11)</b>	<ul style="list-style-type: none"> <li>• Respiratory system</li> <li>• Upper respiratory system (nose, pharynx, larynx, and trachea)</li> <li>• Lower respiratory system (Lungs, thoracic cage, and pleura)</li> <li>• Bronchi, bronchioles, alveoli and respiratory membrane</li> <li>• Respiratory muscles and lung volumes and capacities</li> <li>• Scientific terminologies of the main respiratory system parts</li> </ul>
<b>Session 6 (Week 12-14)</b>	<ul style="list-style-type: none"> <li>• Digestive system</li> <li>• Upper digestive system (mouth, pharynx, and esophagus)</li> <li>• Lower digestive system (stomach, small intestine, and large intestine)</li> <li>• Structure of digestive system walls</li> <li>• Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gall bladder)</li> <li>• Scientific terminologies of the main Digestive system parts</li> </ul>
<b>Session 7 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 8(Week 16-17)</b>	<ul style="list-style-type: none"> <li>• Integumentary system</li> <li>• Skin structure and types</li> <li>• Skin layers and skin color</li> <li>• Receptors and glands</li> </ul>





	<ul style="list-style-type: none"> <li>• Skin burns and disorders</li> <li>• Scientific terminologies of the main skin structures</li> </ul>
Session 9 (Week 18-19)	<ul style="list-style-type: none"> <li>• Urinary system</li> <li>• The main parts of the urinary system</li> <li>• Kidney structure</li> <li>• Nephron and Glomerulus</li> <li>• Types of blood vessels in the kidney</li> <li>• Uterus, bladder and urethra</li> <li>• Scientific terminologies of the main urinary system parts</li> </ul>
Session 10 (Week 20-22)	<ul style="list-style-type: none"> <li>• Endocrine system</li> <li>• Endocrine glands names and locations</li> <li>• Structure, location, and hormones of hypothalamus and pituitary gland</li> <li>• Structure, location, and hormones of thyroid and parathyroid glands</li> <li>• Structure, location, and hormones of pineal and thymus glands</li> <li>• Structure, location, and hormones of pancreas and adrenal glands</li> <li>• Structure, location, and hormones of the ovaries and testicles gland</li> <li>• Structure, location, and hormones of other glandular structures</li> <li>• Scientific terminologies of the main endocrine glands</li> </ul>
Session 11 (Week 23-24)	<ul style="list-style-type: none"> <li>• Reproductive system</li> <li>• Reproductive systems of male and female</li> <li>• Structure and hormones of the ovaries and testes</li> <li>• Production of the sperms and ova</li> <li>• Scientific terminologies of the main parts of reproductive system parts</li> </ul>
Session 12 (Week 25-26)	<ul style="list-style-type: none"> <li>• Central Nervous system</li> <li>• brain, spinal cord, &amp; peripheral nerves</li> <li>• Neurons (types and structure)</li> <li>• Neurotransmitters and synapses</li> <li>• Scientific terminologies of the main parts of the central nervous system parts</li> </ul>
Session 13 (Week 27-28)	<ul style="list-style-type: none"> <li>• Autonomic Nervous system</li> <li>• Sympathetic and parasympathetic autonomic nervous system</li> <li>• Preganglionic and postganglionic neurons</li> <li>• Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system</li> <li>• Scientific terminologies of the main parts of the autonomic nervous system parts</li> </ul>
Session 14 (Week 29)	Revision and discussion
<b>Session 15 (Week 30-32)</b>	<b>Final Exam</b>
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.



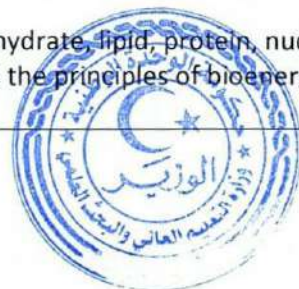


Course Change	Information contained in this course outline is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational employment and marketing needs. The instructor will endeavor to provide notice of changes to students as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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Lippincott's Illustrated Reviews: Biochemistry. ISBN-13: 978-1496344496 ISBN-10: 1496344499.</li> <li>• Harper's Illustrated Biochemistry. ISBN-13: 978-1259837937. ISBN-10: 1259837939.</li> <li>• Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148.</li> <li>• Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840.</li> <li>• Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> <li>• <a href="http://www.kume.edu/biochemistry/resource.html">http://www.kume.edu/biochemistry/resource.html</a></li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Know the nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis.</li> </ul>





	<ul style="list-style-type: none"> <li>• 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.</li> <li>• The tools used in biochemistry, and their potential applications to medical technology science.</li> <li>• Use the commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals.</li> <li>• Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body.</li> <li>• Identify and explain the structure and functions of each body system.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
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)	<b>Midterm Exam</b>
Session10(Week 13)	• Chemistry of Lipids
Session11(Week 14 & 15)	<b>Midterm practical exam</b>
Session12(Week 16)	•Enzymes
Session13(Week 17)	• Porphyrins
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)	<b>Final practical Exam</b>
Session22 (Week 30)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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**

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## 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
<b>Brief Description:</b>		<p>The course enables students to know:</p> <ul style="list-style-type: none"> <li>* The microorganism and definition of all branch of microbiology * The classification of Microorganisms and different between prokaryotic and eukaryotic cells.</li> <li>*Methods and types sterilization and disinfectant.</li> <li>* Culturing and cultivation of Microorganisms and basic way of their identifications</li> </ul>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Text book of microbiology First Published in 2010 by Prem C. Bakliwal for Aavishkar Publishers ISBN 978-81-7910-306-7.</li> <li>• <a href="https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text Book of Microbiology.pdf">https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text Book of Microbiology.pdf</a></li> <li>• <a href="https://open.umn.edu/opentextbooks/textbooks/873">https://open.umn.edu/opentextbooks/textbooks/873</a></li> <li>• <a href="https://www.britannica.com/science/microbiology">https://www.britannica.com/science/microbiology</a></li> <li>• <a href="https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/1%3A_Introduction_to_Microbiology">https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/1%3A_Introduction_to_Microbiology</a></li> <li>• <a href="https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf">https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells.</li> <li>• Comprehend the fundamentals of molecular microbiology.</li> <li>• Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.</li> </ul>





	<ul style="list-style-type: none"> <li>Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health.</li> <li>Understand Microbial Cell Structure, Function and metabolism.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	• Introduction, of microbiology
<b>Session 2 (Week 2)</b>	History of Microbiology
<b>Session 2 (Week 3)</b>	<ul style="list-style-type: none"> <li>Defining Microbes and Basic concepts and scope of microbiology</li> </ul>
<b>Session 3 (Week 4)</b>	Pasteur and spontaneous Generation
<b>Session 4 (Week 5 &amp; 6)</b>	Types of microorganisms
<b>Session 5(Week 7,8)</b>	Classification of microorganisms
<b>Session6(Week 9)</b>	Immunization, antiseptics and antibiotics
<b>Session 7(Week 10)</b>	Microscopy
<b>Session 8(Week 11)</b>	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
<b>Session9(Week 12)</b>	Bacterial structure& composition
<b>Session10(Week 13)</b>	Bacterial Genetics
<b>Session11(Week 14 &amp; 15)</b>	4. Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
<b>Session12(Week 16)</b>	<b>Midterm exam</b>
<b>Session13(Week 17)</b>	Isolation and culturing of Bacteria
<b>Session14(Week 18 &amp; 19)</b>	Microbial metabolism
<b>Session15(Week 20)</b>	Classification of bacteria
<b>Session16(Week 21)</b>	Dyes and staining (gram stain, acid fast staining, and other staining methods).
<b>Session17(Week22 &amp; 23)</b>	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
<b>Session18(Week 24 &amp; 25,26)</b>	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
<b>Session19(Week 27,28)</b>	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
<b>Session21 (Week 29)</b>	<b>Final practical Exam</b>
<b>Session22 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Histology
2	<b>Course Code</b>	MT204
3	<b>Course type: /general/specialty/optional</b>	General
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	non
7	<b>Program offered the course</b>	Medical Laboratories Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• DiFiore's atlas of histology with functional correlations. Junqueira's Basic Histology.</li> <li>• Histology: An Essential Textbook by D. J. Lowrie Jr 2020</li> <li>• Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021</li> <li>• Textbook of Histology by Leslie P. Gartner PhD 2021</li> <li>• Histology: A Text and Atlas 7<sup>th</sup> edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015</li> <li>• Wheater's Functional Histology: A Text and Colour Atlas 3<sup>rd</sup> edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based. Group interaction and discussion. self-directed activities.





	active participation. Laboratory experiments.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Understand the changes that occur to tissues</li> <li>• Identify the different types of tissues</li> <li>• Recognize the types of tissues and the mechanisms of identifying them</li> <li>• understand the various diagnostic tools and medical equipment in the correct way to discover histological changes</li> <li>• Understand how to distinguish tissue and how it develops</li> <li>• deduce the causes of the changes that have occurred within the tissues</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %      Activity 10 %      Attendance 10 % Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• Introduction to histology</li> <li>• histology and its mode of study</li> </ul>
<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li>• The cell</li> </ul>
<b>Session 3 (Week 3)</b>	<ul style="list-style-type: none"> <li>• Epithelial Tissue</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Connective tissue</li> </ul>
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• Cartilage</li> </ul>
<b>Session 6 (Week 6)</b>	<ul style="list-style-type: none"> <li>• Bone</li> </ul>
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>• Bone.</li> </ul>
<b>Session 8 (Week 8)</b>	Muscle Tissue
<b>Session 9 (Week 9)</b>	Nerve Tissue
<b>Session 10 (Week 10)</b>	• Nervous System
<b>Session 11 (Week 11)</b>	The Immune System &
<b>Session 12 (Week 12)</b>	Lymphoid Organs
<b>Session 13 (Week 13)</b>	Blood and Hemopoiesis
<b>Session 14 (Week 14)</b>	Endocrine System
<b>Session 15 (Week 15)</b>	Hormones
<b>Session 16 (Week 16)</b>	The integumentary system
<b>Session 17 (Week 17)</b>	The Circulatory system
<b>Session 18 (Week 18)</b>	The Circulatory system
<b>Session 19 (Week 19)</b>	The Circulatory system
<b>Session 20 (Week 20)</b>	• Respiratory system
<b>Session 21 (Week 21)</b>	Respiratory system
<b>Session 22 (Week 22)</b>	Respiratory system
<b>Session 23 (Week 23)</b>	Digestive system
<b>Session 24 (Week 24)</b>	The urinary system





<b>Session 25 (Week 25)</b>	The urinary system
<b>Session26(Week26- 27)</b>	Reproductive system
<b>Session 28 (Week 28)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
	<b>Brief Description:</b>	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)
	<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1</li> <li>• Principles of anatomy and physiology/ArthurGerard J., Bryan D. – 12<sup>th</sup> ed.ISBN 978-0-470-08471-7</li> <li>• Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
	<b>Course Duration</b>	4 * 28 = 112 teaching hours
	<b>Delivery</b>	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.
	<b>Course Objectives:</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• Have sufficient basic knowledge in medical physiology.</li> <li>• Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.</li> <li>• State the functions of each organ system of the body, explain the mechanisms by which each functions, and</li> </ul>





	<p>relate the functions and the anatomy and histology of each organ system.</p> <ul style="list-style-type: none"> <li>• Understand and demonstrate the interrelations of the organ systems to each other.</li> <li>• Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses.</li> <li>• Explain the pathophysiology of common diseases related to the organ systems of the body</li> <li>• The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %      Activity 10 %  Attendance 10 %      Final Exam 60 %  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<p>Introduction, Autonomic nervous system, Blood, Nerve &amp; muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)</p> <ul style="list-style-type: none"> <li>• Inform students how student learning program of the year-wise has been organized</li> <li>Help students organize and manage their studies throughout the year</li> <li>• Inform students how student learning program of the year-wise has been organized</li> <li>Help students organize and manage their studies throughout the year</li> <li>• Guide students on assessment methods, rules and regulations</li> <li>• Introduction ( Total body water , cell membrane and cell transport)</li> </ul>
<b>Session 2 (Week 2)</b>	<p>Autonomic Nervous System</p> <ul style="list-style-type: none"> <li>• Types Autonomic Nervous System</li> <li>• Chemical neurotransmitters</li> <li>• Function of sympathetic &amp; Parasympathetic</li> </ul> <p>Assignment 2 handed out</p>
<b>Session 3 (Week 3)</b>	<p>The blood:</p> <ul style="list-style-type: none"> <li>• Major components and function of the blood</li> <li>• Red &amp; white blood cells</li> <li>• Plasma protein and function</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Blood groups &amp; hemostasis</li> </ul> <p>Blood clotting disorders</p>
<b>Session 5 (Week 5)</b>	<p>Nerve &amp; Muscle</p> <ul style="list-style-type: none"> <li>• Structure of nerve cell</li> <li>• Properties of neuron</li> <li>• Resting membrane potential</li> </ul>
<b>Session 6 (Week 6)</b>	<p>Nerve &amp; Muscle</p>





	<ul style="list-style-type: none"> <li>• Action potential</li> <li>•Excitation- contraction coupling</li> <li>• Mechanism of muscle contraction &amp; relaxation</li> </ul>
Session7(Week 7)	Cardiovascular system <ul style="list-style-type: none"> <li>• Anatomy of the heart</li> <li>• Functional properties of cardiac muscle</li> <li>•Action potential &amp; Conducting System</li> </ul>
Session 8(Week 8)	<ul style="list-style-type: none"> <li>•Cardiac Cycle &amp; Heart sound</li> <li>•Electrocardiograph</li> </ul>
Session 9(Week 9)	<ul style="list-style-type: none"> <li>• Blood pressure</li> <li>•Cardio dynamic</li> <li>•Arrhythmia &amp; circulatory Shock</li> </ul>
Session10(Week 10)	<ul style="list-style-type: none"> <li>•Arrhythmia</li> <li>•circulatory Shock</li> </ul>
Session11(Week 11)	Respiratory System <ul style="list-style-type: none"> <li>• Structure of the respiratory system</li> <li>• Lung volume &amp; Capacities</li> </ul>
Session12(Week 12)	<ul style="list-style-type: none"> <li>•Oxygen &amp; Carbon Dioxide in blood</li> <li>•Dissociation oxygen curve shift</li> </ul>
Session13(Week 13)	<ul style="list-style-type: none"> <li>•Transport carbon dioxide</li> <li>•Regulation of respiratory</li> <li>• Hypoxia</li> </ul>
Session14(Week 14)	Nervous System <ul style="list-style-type: none"> <li>•Division of the nervous system</li> <li>•Units of Nervous system</li> <li>•Types of Receptors</li> </ul>
Session15(Week 15)	<b>Mid exam</b>
Session15(Week 16)	Nervous System: <ul style="list-style-type: none"> <li>•Properties of receptors, Synapse,Types of synapse, Mechanism of neurotransmitter</li> </ul>
Session16(Week 17)	<ul style="list-style-type: none"> <li>•Somatic sensation</li> <li>•TypesSomatic sensation</li> <li>• Pain sensation</li> <li>•Pathways</li> </ul>
Session17(Week 18)	<ul style="list-style-type: none"> <li>•Referred Pain</li> <li>•Pain Control System</li> </ul>
Session18(Week19)	Special senses <ul style="list-style-type: none"> <li>•Vision</li> <li>•Hearing</li> </ul>
Session19(Week 20)	<ul style="list-style-type: none"> <li>•Special senses</li> <li>•Gustation</li> <li>•Olfaction</li> </ul>
Session20(Week 21)	Gastrointestinal tract <ul style="list-style-type: none"> <li>•characteristics of gastrointestinal wall</li> <li>•Explain functional types of movements in GIT</li> <li>•Control of GIT</li> </ul>
Session21(Week 22)	<ul style="list-style-type: none"> <li>•GIT hormones and their role in digestive process</li> <li>•Describe GIT reflexes</li> <li>•Mastication and salivary secretions</li> </ul>
Session22 (Week 23)	<ul style="list-style-type: none"> <li>•Describe motor functions of stomach</li> <li>•Explain regulation of stomach emptying &amp;the composition, function and •regulation of gastric secretions</li> <li>•Vomiting reflex</li> </ul>





<b>Session23 (Week 24)</b>	<ul style="list-style-type: none"> <li>•Gall bladder and biliary tract</li> <li>•intestinal motility</li> <li>•Defecation reflex</li> </ul>
<b>Session25 (Week 25,26)</b>	Urinary system <ul style="list-style-type: none"> <li>•The kidney</li> <li>•Urine formation</li> <li>•Micturition</li> <li>•Renal failure</li> <li>•Male reproductive</li> <li>•Female reproductive</li> </ul>
<b>Session26 (Week 27,28)</b>	Endocrine System Pituitary gland Thyroid gland Parathyroid Adrenal gland Endocrine cell in other organs
<b>Session27 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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%
<b>Generic Skills</b>	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.
<b>Course Change</b>	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: 2<sup>nd</sup> 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.






	<ul style="list-style-type: none"> <li>• Teaching Techniques for Church Education. Evangelical Training Association, 1983.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Up on completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the principle domains of psychology that are most relevant to medicine.</li> <li>• Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings.</li> <li>• Be familiar with the application of psychology in the wider practice of medicine.</li> <li>• understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses.</li> <li>• Will be able to define and list the fruits of the spirit.</li> <li>• The student will be able to explain why the fruit of the spirit are important to believers.</li> <li>• The student will be able to assess which fruits are most and least evident in their own lives.</li> <li>• The student will develop a plan to practice more of the fruit of the spirit for the next week</li> <li>• Understand the basics of the teaching methods</li> <li>• Know different techniques of teaching and questions preparations.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An introduction to Medical psychology
<b>Session 2 (Week 2)</b>	Psychology and Medicine <ul style="list-style-type: none"> <li>• Explain what the field of Psychology studies.</li> <li>• Describe the different areas of Psychology.</li> <li>• Describe the way by which Psychology is linked to Medicine.</li> </ul>
<b>Session 3 (Week3-4)</b>	Brain Mechanisms and Behaviour <ul style="list-style-type: none"> <li>• Describe the basics of Neural Communication.</li> <li>• Explain the Basic Structure and function of the Nervous system.</li> <li>• Outline the link between biology and behavior.</li> </ul>
<b>Session 4 (Week 5)</b>	Senses and Integration on Senses <ul style="list-style-type: none"> <li>• Describe the role and the importance of the different types of senses.</li> <li>• Outline the main functional theories of vision.</li> <li>• Outline the main functional theories of audition.</li> <li>• Outline the main theories of somatosensation.</li> <li>• Outline the main theories of the functions of smell</li> </ul>





<b>Session5 (Week 6)</b>	<ul style="list-style-type: none"> <li>• Perception, attention and Memory</li> <li>• Outline the role of the different types of perception.</li> <li>• Describe the main theories of visual perception.</li> <li>• Describe the main theories of auditory perception.</li> <li>• Outline the main types of attention.</li> <li>• Describe the main theories of attention.</li> <li>• Outline the main types of memory.</li> <li>• Describe the main theories of memory</li> </ul>
<b>Session 6 (Week 7)</b>	<p>Child Development (from birth to adolescence)</p> <ul style="list-style-type: none"> <li>• Describe the different stages of development from birth to adolescence.</li> <li>• Outline the main theories of child development.</li> <li>• Outline the main theories of early stages of language acquisition.</li> <li>• Describe the main theories of language development.</li> <li>• Outline the theories connecting language and cognition.</li> <li>• Language and the brain.</li> </ul>
<b>Session 7(Week 8)</b> 	<p>Language, Motivation and Emotions</p> <p>Individual Differences in Intelligence and Personality</p> <ul style="list-style-type: none"> <li>• Outline the area of Motivation.</li> <li>• Outline the way by which motivation is link with emotion.</li> <li>• Outline the main theories of Emotions.</li> <li>• Describe the biological theories of emotions.</li> <li>• Describe the psychological theories of emotions.</li> <li>• Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools.</li> <li>• Outline the main Psychometric tools and their role in diagnosis.</li> <li>• Outline the main Personality tests and their value in clinical assessment.</li> </ul>
<b>Session 8 (Week 9)</b>	<p>Adulthood and Sexual Behaviour</p> <ul style="list-style-type: none"> <li>• Describe the characteristics of Adulthood.</li> <li>• Outline the interconnection between psychological and biological characteristics of this stage of human development.</li> <li>• Distinguish between Psychoanalytic and Psychological views on sexuality.</li> <li>• Describe the role of sex in human relationships</li> <li>• Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.</li> </ul>
<b>Session 9 (Week 10)</b>	<ul style="list-style-type: none"> <li>• Sleep, Consciousness, Family Aging, Death and Bereavement</li> <li>• Explain the different stages of sleep as described by EEG studies</li> </ul> <p>Outline the three theories of sleep.</p> <ul style="list-style-type: none"> <li>• Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation.</li> <li>• Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.</li> </ul>



	<ul style="list-style-type: none"> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> </ul>
<b>Session 10 (Week 11)</b>	<p>Psychology and Medicine: Patients and Doctors</p> <ul style="list-style-type: none"> <li>• Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions.</li> <li>• Outline the Biomedical and the Biopsychosocial Approaches to Medicine.</li> <li>• Identify the advantages and disadvantages of each approach in the development of modern medicine.</li> <li>• Outline the impact of psychological principles in doctor patient contact and communication.</li> </ul>
<b>Session 11 (Week 12)</b>	<p>Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment</p> <ul style="list-style-type: none"> <li>• Describe the different factors contributing to the impact that hospitalisation has on people.</li> <li>• Describe the potential psychological impact that hospitalisation may have on people.</li> <li>• Outline the role of psychosocial approaches in medical practice.</li> <li>• Outline the role of placebo effect in the treatment of both physical and psychological treatments.</li> <li>• Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis.</li> <li>• Outline the way by which psychological factors contribute to the development of somatic problems.</li> <li>• Describe different types of psychosomatic problems.</li> <li>• Outline possible ways of distinguishing between psychosomatic and physical problems.</li> </ul>
<b>Session 12 (Week 13)</b>	<p>Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation</p> <ul style="list-style-type: none"> <li>• Outline the psychological factors contributing to coping with illness and disability.</li> <li>• Describe the different approaches and techniques employed for coping with these difficulties.</li> <li>• Outline the different areas of Psychopathology.</li> <li>• Outline the methods employed in the diagnosis of psychological and psychiatric disorders.</li> <li>• Outline the treatments often used in the treatment of psychiatric and psychological disorders.</li> <li>• Explain what is meant by chronic mental illness and the process of rehabilitation.</li> </ul>
<b>Session 14 (Week 14)</b>	<b>Midterm Exam</b>





Session 16 (Week 16)	<ul style="list-style-type: none"> <li>Teaching Principles</li> </ul>
Session 17 (Week 17)	<ul style="list-style-type: none"> <li>Student Centered vs. Teacher Centered Learning</li> </ul>
Session 18 (Week 18)	<ul style="list-style-type: none"> <li>Learning Styles</li> </ul>
Session 19 (Week 19)	<ul style="list-style-type: none"> <li>Creating a Lesson: Overview</li> <li>Creating a Lesson: Goals</li> <li>Creating a Lesson: Outcomes</li> </ul>
Session 20 (Week 20)	<ul style="list-style-type: none"> <li>Creating a Lesson: Information Delivery</li> </ul>
Session 21(Week 21-22)	<ul style="list-style-type: none"> <li>Teaching Methods</li> </ul>
Session 22 (Week 23)	<ul style="list-style-type: none"> <li>Creating a Lesson: Activities</li> </ul>
Session 23 (Week 24)	<ul style="list-style-type: none"> <li>Creating a Lesson: Measurement</li> </ul>
Session 24 (Week 25)	<ul style="list-style-type: none"> <li>Creating a Lesson: Evaluation</li> </ul>
Session 25 (Week 26)	<ul style="list-style-type: none"> <li>The Teacher's Responsibilities</li> </ul>
Session26(Week27-28)	<ul style="list-style-type: none"> <li>Presentations</li> </ul>
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير</li> <li>• مقدمة في زراعه الاعضاء، د. الهادي عصمان</li> <li>• WMA medical ethics manual 2015</li> <li>• <a href="#">Principles of Biomedical Ethics, 5th edn.</a></li> <li>• <a href="https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4">https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4</a></li> </ul>
<b>Course Duration</b>		2 * 28 = 56 teaching hours
<b>Delivery</b>		Lectures, Problem based learning and Class discussion.
<b>Course Objectives:</b>		<p>By the end of this course student will be able to:</p> <ul style="list-style-type: none"> <li>• convey to students, the pivotal role ethics holds in medical practice.</li> <li>• introduces the key underlying ethical principles required in medicine.</li> <li>• Use the application of these principles will be brought to life through case based learning (CBL).</li> <li>• Recognize ethical issues when they arise in their practice</li> <li>• Deal with these issues in a systematic manner</li> <li>• Understand the ethics of medical research</li> <li>• create an awareness on medical Ethics and Human Values.</li> <li>• instill Moral and Social Values and Loyalty</li> <li>• appreciate the rights of others.</li> </ul>
<b>Course Assessments</b>		<p>Midterm exam 20 %      Activity 10 %  Attendance 10 %      Final Exam 60 %  A 60% is required for a pass in this course.</p>



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)	<b>Med term exam</b>
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)	<b>Final Exam</b>
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

<b>Brief Description:</b>	<p>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:</p> <p>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</p>
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2).</li> <li>Buchbinder, S.B., &amp; Shanks, N.H. (2012). Introduction to Health Care Management Jones &amp; Bartlett, Publishers, 2nd Edition.</li> <li>Essential Textbook of Health Management             <ol style="list-style-type: none"> <li>July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8.</li> </ol> </li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	A Lecture-based ppt and practical training B Group interaction and discussion
<b>Course Objectives:</b>	<p>Up on completion of the course the students will be enable to:</p> <ul style="list-style-type: none"> <li>Learn concepts and theories in health care management;</li> <li>Develop skills in using materials tools and/or technology central to health care mgt;</li> <li>Learn to understand perspectives and values of health care management;</li> <li>Develop the basic management skills and ability to work productively with others;</li> <li>Learn to select, use, and critically analyze current HCMN research and literature;</li> </ul>







	<ul style="list-style-type: none"> <li>• Integrate health care management theory with real world situations</li> <li>• Develop the ability to work productively with others in diverse teams.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An Introduction to the Health management
<b>Session 2 (Week 2)</b>	The historical role of medical and nursing health services
<b>Session 3 (Week 3)</b>	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
<b>Session 6(Week 6)</b>	Hospital concept and classification hospital environment
<b>Session 7 (Week 7)</b>	Hospital health planning
<b>Session 8 (Week 8)</b>	The organizational structure of the hospital
<b>Session 9(Week 9)</b>	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
<b>Session 10(Week 10)</b>	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
<b>Session 11(Week 11)</b>	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
<b>Session 12(Week 12)</b>	Leadership and management An overview of healthcare management and leadership
<b>Session 13(Week 13)</b>	Management and motivation
<b>Session 14(Week 14)</b>	<b>Midterm Exam</b>
<b>Session 15(Week 15)</b>	Organizational Behavior (OB) and Management Thinking
<b>Session 16(Week 16)</b>	Quality Improvement
<b>Session 17(Week 17)</b>	Health care information Technology Health and Nursing Information Collection System
<b>Session 18(Week 18)</b>	Healthcare Financing, Cost and revenue management
<b>Session 19(Week 19-20)</b>	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources



<b>Session 20(Week 21)</b>	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
<b>Session 21(Week22)</b>	Fraud and abuse
<b>Session 22(Week 23)</b>	Communication, health administration
<b>Session 23(Week 24)</b>	Administrative Support in Healthcare Organizations
<b>Session 24(Week 25)</b>	Clinical Care in Healthcare Organizations
<b>Session 25(Week 27)</b>	Medical Laboratories Management
<b>Session 26(Week 28)</b>	Revision and discussion
<b>Session 27(Week 29-30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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 (3<sup>rd</sup> edition). London, UK: TJ International Ltd, Padstow, Cornwall
- 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.





	<ul style="list-style-type: none"> <li>• <a href="http://www.pitt.edu/~super7/43011-44001/43911.ppt">http://www.pitt.edu/~super7/43011-44001/43911.ppt</a></li> <li>• <a href="http://web.tamu-commerce.edu/academics/graduateSchool/">http://web.tamu-commerce.edu/academics/graduateSchool/</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Upon completing this course, each student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand some basic concepts of research and its methodologies and identify appropriate research topics.</li> <li>• Demonstrate knowledge of research processes (reading, evaluating, and developing).</li> <li>• Perform literature reviews using print and online databases.</li> <li>• Understand the formats for citations of print and electronic materials.</li> <li>• Identify, explain, compare, and prepare the key elements of a research proposal/report.</li> <li>• Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them.</li> <li>• Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research.</li> <li>• Describe sampling methods, measurement scales and instruments, and appropriate uses of each.</li> <li>• Explain the rationale for research ethics and importance</li> <li>• select and define appropriate research problem and parameters</li> <li>• prepare a project proposal (to undertake a project)</li> <li>• organize and conduct research (advanced project) in a more appropriate manner</li> <li>• Write a research report, thesis and research proposal.</li> <li>• Make Critical Appraisal of the Literature</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<p>Introduction to research methodology</p> <ul style="list-style-type: none"> <li>• Meaning of Research</li> <li>• Definitions of Research</li> <li>• Objectives of Research</li> </ul>
<b>Session 2 (Week 2)</b>	<p>Introduction to research methodology</p> <ul style="list-style-type: none"> <li>• Motivation in Research</li> <li>• General Characteristics of Research</li> <li>• Criteria of Good Research</li> </ul>
<b>Session 3 (Week 3)</b>	<p>The Research Problem</p> <ul style="list-style-type: none"> <li>• Scientific Thinking</li> <li>• What is a Research Problem?</li> <li>• Selecting the Problem</li> <li>• Sources of the Problem</li> <li>• Defining a Problem</li> <li>• Statement of a Problem</li> <li>• Delimiting a Problem</li> </ul>





	<ul style="list-style-type: none"> <li>Evaluation of a Problem</li> </ul> Assignment 1 handed out
Session 4 (Week 4)	<ul style="list-style-type: none"> <li>The Review of Literature               <ul style="list-style-type: none"> <li>Meaning of Review of Literature</li> <li>Need of Review of Literature</li> <li>Objectives of Review of Literature</li> <li>Sources of Literature</li> <li>The Functions of Literature</li> <li>How to Conduct the Review of Literature</li> <li>Some Hints for the Review of Literature</li> <li>Precautions in Library Use</li> <li>Reporting the Review of Literature</li> </ul> </li> </ul>
Session 5 (Week 5)	Practice on how to find a literature <ul style="list-style-type: none"> <li>Selecting a topic</li> <li>Highlighting the electronic websites that help to better search of literature</li> </ul>
Session 6 (Week 6)	The Research Hypotheses <ul style="list-style-type: none"> <li>Meaning of Hypothesis</li> <li>Definitions of Hypothesis</li> <li>Nature of Hypothesis</li> <li>Functions of Hypothesis</li> <li>Importance of Hypothesis</li> <li>Kinds of Hypothesis</li> <li>Characteristics of a Good Hypothesis</li> <li>Variables in a Hypothesis</li> <li>Formulating a Hypothesis</li> <li>Testing the Hypothesis</li> </ul> Assignment 2 handed out
Session 7 (Week 7)	The Research Approach <ul style="list-style-type: none"> <li>The Philosophical Background</li> <li>The Qualitative Approach</li> <li>The Quantitative Approach</li> <li>The Mixed-Methods Approach</li> </ul>
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs <ul style="list-style-type: none"> <li>Meaning of research design</li> <li>Need for research design</li> <li>features of a good design</li> </ul>
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper <ul style="list-style-type: none"> <li>selecting paper</li> <li>guidelines of reading research paper</li> </ul>
Session 12 (Week 12)	Assignment of research paper <ul style="list-style-type: none"> <li>Review before submitting the assignment</li> </ul>
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	<b>Midterm Exam</b>
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling





	<ul style="list-style-type: none"> <li>• Meaning and Definition of Sampling</li> <li>• Functions of Population and Sampling</li> <li>• Methods of Sampling</li> <li>• Characteristics of a Good Sample</li> <li>• Size of a Sample</li> </ul>
<b>Session 20 (Week 20)</b>	Data Collection Methods <ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Interviews</li> <li>• Focus Groups</li> <li>• Observation</li> </ul>
<b>Session 21 (Week 21)</b>	Interviewing techniques <ul style="list-style-type: none"> <li>• Face-to-face interview</li> <li>• Telephone interview</li> <li>• Computer based interview</li> </ul>
<b>Session 22 (Week 22)</b>	Data management and analysis <ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• inferential statistics</li> </ul>
<b>Session 23 (Week 23)</b>	Writing research proposal
<b>Session 24 (Week 24)</b>	Writing research report
<b>Session 25 (Week 25)</b>	Critical Appraisal of the Literature
<b>Session 26 (Week 26)</b>	Guidelines for submitting graduation project
<b>Session 27 (Week 27)</b>	Review of research methodology
<b>Session 28 (Week 28)</b>	Revision and discussion
<b>Session 29 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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:		<ul style="list-style-type: none"> <li>• Modern Analytical Chemistry by David Harvey 2009</li> <li>• Textbook of Analytical Chemistry by Harsh Malhotra 2011 ISBN-13978-8184113143</li> <li>• Analytical Chemistry, 7th Edition by Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug ISBN: 978-1-118-80516-9, 2013</li> <li>• Christian, Gary D., Analytical Chemistry, 5th ed., John Wiley &amp; Sons, New York, 1994.</li> <li>• Day, R. A. and Arthur L. Underwood, Quantitative Analysis, 6th ed., Prentice Hall, Upper Saddle River, NJ, 1991.</li> <li>• Ewing, Galen Wood, Ed., Analytical Instrumentation Handbook, 2nd ed, Marcel Dekker, New York, 1997.</li> <li>• 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.</li> <li>• Harris, Daniel C., Quantitative Chemical Analysis, 5th ed., W. H. Freeman &amp; Co., New York, 1998.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul> <p>أساسيات الكيمياء التحليلية د. عاطف نصار</p>
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:





	<ul style="list-style-type: none"> <li>• Understand basic principles of analytical chemistry and various analytical techniques</li> <li>• Explore a range of instrumental methods of analysis, including mass spectrometry, as well as spectroscopic, chromatographic, and immunochemical methods</li> <li>• Be able to interpret analytical data and evaluate error and uncertainty in measurements</li> <li>• Understand the analyst's role and analytical chemistry applications in the clinical setting</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1&amp;2)</b>	• Introduction to analytical chemistry
<b>Session 2 (Week 3&amp;4)</b>	• Basic tools of analytical chemistry
<b>Session 3 (Week 5)</b>	• Concentration expression
<b>Session 4 (Week 6&amp;7)</b>	Weight percentage and volume percentage
<b>Session 5 (Week 8&amp;9)</b>	• Molality and mole fraction
<b>Session 6 (Week 10)</b>	• Molarity and Normality concentration
<b>Session 7 (Week 11&amp;12)</b>	• Methods of expression substance quantity
<b>Session 8 (Week 13)</b>	<b>Midterm Exam</b>
<b>Session 9 (Week 14)</b>	• Equivalent weight of compounds
<b>Session 10 (Week 15)</b>	• Stoichiometric calculations
<b>Session 11 (Week 16)</b>	• Parts per thousand (ppt)
<b>Session 12 (Week 17)</b>	• Parts per million (ppm)
<b>Session 13 (Week 18)</b>	• Parts per billion (ppb)
<b>Session 14 (Week 19&amp;20)</b>	• Dilution calculation of solution
<b>Session 15 (Week 21&amp;22)</b>	• Measure of acidity (pH)
<b>Session 16(Week 23&amp;24)</b>	• Collecting and Preparing Samples
<b>Session 17(Week 25)</b>	• Gravimetric Methods
<b>Session 18(Week 26)</b>	• Titrimetric methods
<b>Session 19(Week 27&amp;28)</b>	• Equilibrium chemistry
<b>Session 20 (week 29)</b>	Revision and discussion
<b>Session 20 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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).
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Clinical Chemistry: Principles, Procedures, Correlations (Bishop).</li> <li>• Practical Clinical Biochemistry (Varley).</li> <li>• Teitz textbook of clinical chemistry, handouts and sheets, also some web links may be used in this course provided after any lecture by instructor.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		PowerPoint Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Discuss the role of clinical chemistry in medical laboratory.</li> <li>• Define the following terms: old &amp; SIU units, laboratory safety, percentage solutions, morality, normality and buffers.</li> <li>• Identify and describe different types of specimens used in clinical chemistry.</li> <li>• Recognize to the formation and composition of urine and discuss the importance of urine analysis.</li> <li>• Describe the operation and component part of the following instrument colorimeter, spectrophotometers and centrifuge.</li> <li>• Recognize different means by which glucose maybe metabolized.</li> <li>• Write Briefly the general function of plasma proteins and lipoproteins with explanation of their metabolism abnormality.</li> </ul>
<b>Course Assessments</b>		Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>		<b>Topics Coverage</b>
<b>Session 1 (Week 1&amp;2)</b>		• Introduction to clinical chemistry





	Definition and terminology – role in medicine
<b>Session 2 (Week 3&amp;4)</b>	<ul style="list-style-type: none"> <li>• Lab safely in clinical chemistry</li> <li>• precaution and biohazards</li> <li>• chemical &amp; physical hazards</li> <li>• PPE</li> </ul> Assignment 2 handed out
<b>Session 3 (Week 5&amp;6)</b>	<ul style="list-style-type: none"> <li>• Units of measurements conventional of SIU</li> <li>• Methods of concentrations expressions ( Molarity, normality , percentage , molality )</li> </ul>
<b>Session 4 (Week 7&amp;8)</b>	<ul style="list-style-type: none"> <li>• Collections transport and storage of specimens (phlebotomy).</li> <li>• Anticoagulants used in clinical chemistry types, functions, mode of action &amp; uses.</li> </ul>
<b>Session 5(Week 9&amp;10)</b>	<ul style="list-style-type: none"> <li>• Colorimeter and spectrophotometer (1) ( operations , Definitions , principles , component part )</li> <li>• Colorimeter and spectrophotometer (2) ( operations , Definitions , principles , component part )</li> </ul>
<b>Session 6 (Week 11&amp; 12)</b>	<ul style="list-style-type: none"> <li>• Renal physiology , Anatomy ( urine formation )</li> <li>• Urine analysis (1) physical examination (Macroscopic examination)</li> </ul>
<b>Session 7 (Week13&amp;14)</b>	<ul style="list-style-type: none"> <li>• Urine analysis (2) chemical examination .</li> <li>• Urine analysis (3) deposit and Microscopically (type of cell, casts ,crystals.</li> </ul>
<b>Session 8 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 9(Week16&amp;17)</b>	<ul style="list-style-type: none"> <li>• Carbohydrates(1) ( general description ,classification metabolism and regulation</li> </ul>
<b>Session 10(Week18&amp;19&amp;20)</b>	<ul style="list-style-type: none"> <li>• Carbohydrates (2) Disorder, Hyperglycemia of D.M Hypoglycemic.</li> </ul>
<b>Session 11(Week20&amp;21&amp;22)</b>	<ul style="list-style-type: none"> <li>• Glucose Metabolic Alteration Role of lab diagnosis and PT magt.</li> <li>• Plasma protein metabolism synthesis and function</li> <li>• Plasma protein disorders methods of separation</li> </ul>
<b>Session 12(Week23&amp;24)</b>	<ul style="list-style-type: none"> <li>• Quality control ( Definitions terms , type )</li> </ul>
<b>Session 13(Week25&amp;26)</b>	<ul style="list-style-type: none"> <li>• Lipid and lipoproteins chemistry structures.</li> <li>• Lipid and lipoproteins disease correlation.</li> </ul>
<b>Session 14 (Week 27&amp;28)</b>	<ul style="list-style-type: none"> <li>• Lipid &amp; lipoprotein analysis(1)</li> <li>• Lipid &amp; lipoprotein analysis(2)</li> </ul>
<b>Session 14 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Essential Haematology, 6th Edition A. Victor Hoffbrand, Paul A. H. Moss ISBN: 978-1-118-29396-6 2011.</li> <li>• Schmaier, A.H. (2019). Introduction to Hematology. In: Lazarus, H., Schmaier, A. (eds) Concise Guide to Hematology. Springer, Cham.</li> <li>• <a href="https://doi.org/10.1007/978-3-319-97873-4_1">https://doi.org/10.1007/978-3-319-97873-4_1</a></li> <li>• Introduction to haematology by Chris Hatton</li> <li>• <a href="https://doi.org/10.1093/med/9780198746690.003.0510">https://doi.org/10.1093/med/9780198746690.003.0510</a></li> <li>• Introduction to haematology and transfusion science by David Ah-Moye; Ceinwen Davies; Joanne Goody; Peter Hayward; Rebecca Frewin</li> <li>• Evans TC, Jehle D (1991). "The red blood cell distribution width". <i>J Emerg Med.</i> 9 Suppl 1: 71-4.</li> <li>• Miale, John B. Laboratory Medicine: Hematology. 5th. St. Louis: C.V. Mosby, 1977.</li> <li>• <a href="https://askhematologist.com/common-hematology-tests/">https://askhematologist.com/common-hematology-tests/</a></li> <li>• <a href="https://askhematologist.com/common-hematology-tests/#ixzz7jHOE2mPN">https://askhematologist.com/common-hematology-tests/#ixzz7jHOE2mPN</a></li> <li>• <a href="http://www.myvmc.com/anatomy/blood-function-and-composition">http://www.myvmc.com/anatomy/blood-function-and-composition</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor:- /</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, (Presentations) Group interaction and discussion (tutorials) self-directed activities (assignments) active participation (seminars)





	Laboratory experiments (lab lectures)
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand composition, nature and function of blood.</li> <li>• Identify blood forming organs, blood vessels ,hematopoiesis process, blood cells and hemoglobin</li> <li>• Recognize the general concept of blood (its formation, its composition, its properties, its function and its vital role in the human body.</li> <li>• Identify representations, terms, conditions, and some disorders that could affect the blood cells and disturb the hemostasis of the body.</li> <li>• Recognize different aspects of the hematology, blood cells and blood disorders.</li> <li>• Construct a strong foundation and idea regarding the course outlines and contents</li> <li>• Write a good conclusion about the hematology that reflects the extent of comprehension and understanding the course.</li> <li>• Develop a high quality skills in the filled of hematology</li> <li>• Implement the learned stuff practically to reflect the course understanding.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• Introduction to hematology</li> <li>• brief History</li> <li>• Overview and aspects of hematology</li> </ul>
<b>Session 2 (Week 2&amp;3)</b>	<ul style="list-style-type: none"> <li>• Introduction to Blood</li> <li>• Compositions of Blood</li> <li>• Properties of blood</li> <li>• Function of Blood</li> </ul> <p>Assignment 2 handed out</p>
<b>Session 3 (Week 3&amp;4&amp;5)</b>	<ul style="list-style-type: none"> <li>• Circulation system</li> <li>• Blood vessels (arteries, veins and capillaries)</li> <li>• Stem cells (Source of blood)</li> </ul>
<b>Session 4 (Week 6&amp;7)</b>	<ul style="list-style-type: none"> <li>• hematopoiesis</li> <li>• Types of hematopoiesis</li> <li>• Regulation of hematopoiesis</li> <li>• Process of hematopoiesis</li> </ul>
<b>Session 5 (Week 8&amp;9)</b>	<ul style="list-style-type: none"> <li>• Erythropoiesis</li> <li>• RBCs formation</li> <li>• Maturation and regulation of Erythrocytes</li> </ul>
<b>Session 6 (Week 10&amp;11&amp;12)</b>	<ul style="list-style-type: none"> <li>• Characteristics of RBCs</li> <li>• Compositions of RBCs</li> <li>• Life Cycle of RBCs</li> <li>• Bilirubin metabolism</li> <li>• Eryptosis</li> </ul>
<b>Session 7 (Week 13&amp;14)</b>	<ul style="list-style-type: none"> <li>• Myelopoiesis</li> <li>• Monopoiesis</li> <li>• Characteristics of Leucocytes</li> <li>• Function of Leucocytes</li> </ul>






	<ul style="list-style-type: none"> <li>• Regulation of WBCs</li> </ul>
<b>Session 8 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 9 (Week 16&amp;17)</b>	<ul style="list-style-type: none"> <li>• Thrombopoiesis</li> <li>• Platelets formation</li> <li>• Regulation of Thrombopoiesis</li> </ul>
<b>Session 10 (Week 18&amp;19)</b>	<ul style="list-style-type: none"> <li>• Characteristics of Platelets</li> <li>• Platelets Function and Structure</li> <li>• hemorrhage and platelets role in stop bleeding</li> <li>• Fibrinolysis</li> </ul>
<b>Session 11 (Week 20&amp;21)</b>	<ul style="list-style-type: none"> <li>• Clotting factors</li> <li>• Types and function of clotting factors</li> <li>• Clotting factors and clot formation</li> <li>• Sources, activation and mechanism of action of clotting factors</li> </ul>
<b>Session 12 (Week 22&amp;23)</b>	<ul style="list-style-type: none"> <li>• Hemoglobin</li> <li>• Composition of hemoglobin</li> <li>• Biosynthesis of Hemoglobin</li> <li>• Metabolism of hemoglobin</li> </ul>
<b>Session 13 (Week 24 &amp;25)</b>	<ul style="list-style-type: none"> <li>• Types of hemoglobin</li> <li>• Inheritance of hemoglobin</li> <li>• Destruction process of hemoglobin</li> </ul>
<b>Session 14 (Week 26)</b>	<ul style="list-style-type: none"> <li>• Blood typing</li> <li>• Blood group systems</li> <li>• Antigens and antibodies of blood groups</li> </ul>
<b>Session 15 (Week 27&amp;28&amp;29)</b>	<ul style="list-style-type: none"> <li>• Overview of blood disorders</li> <li>• Types of blood disorders</li> <li>• Signs, diagnosis and treatments of blood disorders</li> </ul>
<b>Session 16 (Week 16)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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.





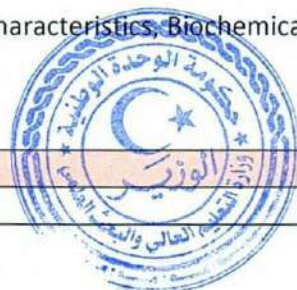
## Medical Bacteriology

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

<b>Brief Description:</b>	<p>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.</p>
<b>Textbooks required for this Course:</b> 	<ol style="list-style-type: none"> <li>1. Bailey &amp; Scott's diagnostic microbiology.</li> <li>2. Diagnostic Microbiology and Infectious Disease</li> <li>3. <a href="https://www.textbookofbacteriology.net/">https://www.textbookofbacteriology.net/</a></li> <li>4. Medical Bacteriology: A Practical Approach (Practical Approach Series, 265) 2nd Edition by Peter Hawkey , Deirdre Lewis 2<sup>nd</sup> edition 2004</li> <li>5. <a href="https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture%20notes/env%20occupational%20health%20students/medicalbacteriology.pdf">https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture notes/env occupational health students/medicalbacteriology.pdf</a></li> <li>6. Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor.</li> </ol>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	PowerPoint Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the laboratory diagnosis of bacterial infection.</li> <li>• Isolate and identify of pathogenic bacteria.</li> <li>• Do different staining and know the advantages and disadvantages of various stains used in bacteriology lab.</li> <li>• Know different types of culture media and biochemical tests and what they are used for.</li> </ul>



	<ul style="list-style-type: none"> <li>Recognize pathogenic bacteria; detection of bacterial antigens and detection of nucleic acid sequences by e.g. PCR technique.</li> <li>Determine the antimicrobials to be used in the sensitivity testing of different types of pathogens.</li> <li>Understand the general characteristics, clinical disease, epidemiology, laboratory diagnosis and the treatment for every pathogenic bacterium.</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1&amp;2)</b>	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
<b>Session 2 (Week 3)</b>	Examples of Two-Component (A-B) Exotoxins with Intracellular Targets. Comparison of bacterial exotoxins with endotoxins Host parasite interaction Pathogen virulence
<b>Session 3 (Week 4 -5)</b>	The Gram Negative Bacilli Family Enterobacteriaceae Antigenic properties of enterobacteriaceae
<b>Session 4 (Week 6 - 7)</b>	Classification of enterobacteriaceae 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)
<b>Session 5 (Week 8 - 9)</b>	Escherichiae: Diagnosis of Escherichiae Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. TREATMENT: Antibiotic sensitivity testing must be performed
<b>Session 6 (Week 10 -11)</b>	<b>Enterobacter spp</b> General properties Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed
<b>Session 7 (Week 12 - 13)</b>	<b>Citrobacter spp</b> Identification, Gram stain; Morphology, Culture Characteristics, Biochemical characteristics. Serological characteristics. Treatment: Antibiotic sensitivity testing must be performed
<b>Session 8 (Week 14)</b>	<b>Midterm Exam</b>
<b>Session 9 (Week 15)</b>	Klebsiella spp





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





<b>Session 15 (Week 27 -28)</b>	<b>Acid fast bacteria</b> Mycobacterium tuberculosis and TB Mycobacterium bovis Mycobacterium leprae, and lyprosy
<b>Session 16 (Week 29)</b>	Opportunistic and nosocomial infections.
<b>Session 17 (Week 30)</b>	Revision and discussion
<b>Session 18 (Week 31 -32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Medical Parasitology
2	<b>Course Code</b>	ML304
3	<b>Course type:</b>	<b>Specialty</b>
4	<b>Accredited units</b>	3 units
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	General Microbiology
7	<b>Program offered the course</b>	Medical Laboratories Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	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 (mainly 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.





<b>Textbooks required for this Course:</b>	<ol style="list-style-type: none"> <li>1. Heelan J.S, Ingersoll F.W. Essential of Human Parasitology. Delmar 2002.</li> <li>2. Cheesbrough M. District Laboratory Practice in Tropical Countries. Part 1, Cambridge 2013.</li> <li>3. Debu University. Parasitology for Health Science Students, lecture note series; 2004.</li> <li>4. Beaver P.C, et al. Clinical Parasitology. K.M Varghese Company; 12th edition, 2010.</li> <li>5. Markell et al. Medical Parasitology. W.B Saunders Company 6th edition 1986.</li> <li>6. Brown H. Basic Clinical Parasitology. ACC Norwalk; 5th edition, 1983.</li> <li>7. Chiodini P.L. et al. Atlas of Medical Helminthology and Protozoology. Churchill Livingstone, 6th edition; 2008.</li> <li>8. Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ol>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, active participation, Laboratory experiments, hospital training.
<b>Course Objectives:</b>	<p>By the end of this course the students should be knowledgeable of:</p> <ul style="list-style-type: none"> <li>• Basic morphology and life cycles of parasites causing human disease.</li> <li>• Specimens to be collected and the methods used for their examination in the diagnosis of parasitic diseases.</li> <li>• An understanding of the clinical diseases caused by these parasites</li> <li>• Understand the classification, clinical features, pathogenesis, laboratory diagnosis and prevention and control measures of protozoa.</li> <li>• Basic practical skills of laboratory techniques (specimen collection, processing, examination and reporting) and apply quality assurance in medical parasitology laboratory.</li> <li>• 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.</li> <li>• Explain the general epidemiological aspects of parasites that affect human</li> <li>• Illustrate the life cycle of specific parasites.</li> <li>• Explain laboratory quality control in parasitology.</li> <li>• List characteristics used to identify protozoa parasites involved in human infections.</li> <li>• Classify parasites having medical significance for human classification of protozoa.</li> <li>• List the most common medically important protozoa.</li> <li>• Describe the prevention and control measures of protozoa.</li> <li>• Compare and contrast the different techniques of protozoa.</li> <li>• Explain laboratory quality control in parasitology.</li> </ul>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam 20 %  Attendances 10%                  Final Exam        60%  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Covered</b>





<b>Session 1 (Week 1)</b>	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
<b>Session 2 (Week 2)</b>	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
<b>Session 3 (Week 3)</b>	2. Taxonomy of protozoa 2.1 Quality control of stool examination 3. Different types of amoebae
<b>Session 4 (week4)</b>	<b>3.1. Entamoeba histolytica</b> Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control <b>3.2. Entamoeba Hertmanni</b> Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control <b>3.3. Entamoeba coli</b> Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control Assignment 1 handed out <b>3.4 Entamoeba gingivalis</b> Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control <b>3.5 Iodamoeba butschili</b> Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control <b>3.6 Entamoeba polecki</b> Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
<b>Session 5 (Week 5)</b>	4. General laboratory diagnosis of parasites 4.1 Types of specimens (urine, blood, stool, sputum, skin.) Assessment • Quiz 1
<b>Session 6 (week 6)</b>	4.2 Collection and preparation of specimen used for parasitological examination 4.3 Preservation of parasites Tutorial for an hour
<b>Session 7 (week7)</b>	4. The Oro-intestinal and Urogenital Flagellates 4.1 General Characteristics of Intestinal flagellates





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





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





<b>Session 17 (week 17)</b>	Blood and tissue nematodes : Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
<b>Session 18 (week 18)</b>	Microfilaria, Tapeworms : T. solium, T. saginatum. D. latum Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
<b>Session 19 (week 19)</b>	Tapeworm : E. granulosus Cysticercosis Hymenolepis nana Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
<b>Session20 (week20&amp;21)</b>	Trematodes : Schistosoma, Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
<b>Session21(week22&amp;23)</b>	Trematodes : Gastrointestinal and pulmonary flukes Epidemiology, Morphology, Transmission and life cycle Clinical features, Laboratory diagnosis Treatment, Prevention& control
<b>Session 22 (week 24)</b>	Assessment • Presentation I Tutorial for an hour
<b>Session 23 (week 25)</b>	Direct Wet mount (Saline, blood, Iodine) &Examination and identification of intestinal parasites.
<b>Session 24 (week 26)</b>	General introduction of Laboratory techniques Collection &Preservation of samples.
<b>Session 25 (week 27)</b>	Stool examination, Concentration Techniques, Sedimentation, Flotation
<b>Session 26 (week 28)</b>	Special Techniques, how to write a report,
<b>Session 27(week 29)</b>	Revision (questions answering and discussion).
<b>Session 28(week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis of Disease 10th Edition - May 18, 2020</li> <li>• Robbins &amp; 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</li> <li>• Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744.</li> <li>• Textbook of pathology by Harsh Mohan 6<sup>th</sup> edition, ISBN: 978-81-8448-702-2, 2010.</li> <li>• <a href="https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf">https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf</a></li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
<b>Course Objectives:</b>		Upon completion of this course, the student will have reliably demonstrated the ability to: <ul style="list-style-type: none"> <li>• Understand the common terms and definitions used in pathology</li> <li>• Identify of the nature of the disease, including its causes, growth patterns, and consequences</li> </ul>





	<ul style="list-style-type: none"> <li>• Recognize the biological characteristics that distinguish each disease from the other.</li> <li>• The ability to distinguish the origin of the disease and how it develops</li> </ul> <p>The ability to distinguish the origin of the disease and how it develops</p> <ul style="list-style-type: none"> <li>• That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment</li> <li>• The student will infer the causes of disease and its growth patterns</li> <li>• The student determines the appropriate diagnostic tools and mechanisms to detect the disease</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• <b>Introduction to pathology</b></li> <li>• Pathology gives explanations of a disease by studying the following four aspects of the disease</li> </ul> <ol style="list-style-type: none"> <li>1. Aetiology</li> <li>2. Pathogenesis</li> <li>3. Morphologic changes</li> <li>4. Functional derangements and clinical significance</li> </ol> <ul style="list-style-type: none"> <li>• The causes of disease</li> </ul> <p>Environmental factors Genetic Factors</p>
<b>Session 2 (Week 2)</b>	<b>Cell injury.</b> - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury ( Reversible & Irreversible cell injury ).
<b>Session 3 (Week 3)</b>	<b>Cell injury.</b> - Free radicals ( sources, effects & destruction of FR ). - Cell injury by chemicals and Cell injury by viruses.
<b>Session 4 (Week 4)</b>	<b>Cell injury.</b> - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• <b>Inflammation .</b></li> </ul> <ol style="list-style-type: none"> <li>a. Acute inflammation &amp; its types.</li> </ol>
<b>Session 6 (Week 6)</b>	<ol style="list-style-type: none"> <li>b. Chronic inflammation, Granuloma &amp; its types.</li> </ol>
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>• <b>Repair and healing.</b></li> </ul>
<b>Session 8 (Week 8)</b>	<ul style="list-style-type: none"> <li>• <b>Infectious diseases.</b></li> </ul> <ol style="list-style-type: none"> <li>a. Bacterial, Viral, Fungal and Parasitic infection - a general outline</li> <li>b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis &amp; Hydatid disease.</li> </ol>
<b>Session 9 (Week 9)</b>	<ul style="list-style-type: none"> <li>• <b>Immunopathology.</b></li> </ul> <ol style="list-style-type: none"> <li>1. Immune mechanism of tissue injury:             <ol style="list-style-type: none"> <li>a. Type I hypersensitivity.</li> <li>b. Type II hypersensitivity.</li> <li>c. Type III hypersensitivity.</li> <li>d. Type IV hypersensitivity.</li> </ol> </li> </ol>





	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)	• <b>Nutrition disorder.</b> Malnutrition, Obesity and Vitamin deficiency disorders.
Session 13 (Week 13)	• <b>Ionizing radiation.</b> a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
Session 14(Week 14)	• <b>Hemodynamic disorders</b> Edema, Hyperemia, Congestion, Hemorrhage
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	<b>GENETIC DISORDERS</b> a. Single - Gene Defect "Mendelian Disorders" b. Disorders with Multifactorial Inheritance
Session 17Week 17	c. Cytogenic Disorders "Chromosomal Aberations"
Session18(Week18)	• <b>Neoplasia.</b> - Tumours, Aetiology & spread, common tumours.
Session19(Week19 - 22)	<b>Respiratory diseases.</b> Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
Session20(Week23 - 27)	<b>Cardiovascular diseases .</b> - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
Session 21(Week28 )	<b>Revision and discussion</b>
Session 22(Week29 - 30 )	<b>Final exam</b>
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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>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</li> <li><a href="http://www.laboratories.org/Patients/Basics/Banking.aspx">http://www.laboratories.org/Patients/Basics/Banking.aspx</a></li> <li>Christopher D. Hillyer - Blood Banking and Transfusion Medicine: Basic Principles and Practice: 2nd (second) Edition Hardcover</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor:-</li> </ul>
<b>Course Duration</b>		6 * 28 = 168 teaching hours
<b>Delivery</b>		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)
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>Figure out Safety in medical laboratory</li> <li>Know types and uses of different blood test tubes in medical laboratory.</li> <li>Collection of blood.</li> <li>know the components, properties and composition of blood</li> <li>Identify the types of blood types present and how to identify them</li> <li>Recognize the the causes and consequences of wrong and unsafe blood transfusions and the consequences of that.</li> <li>Identify the correct mechanisms for receiving patient samples and methods of dealing with them</li> <li>Recognize all types of analyzes for all parts of the body and how to perform them in the laboratory.</li> <li>Understands the accuracy of the results of blood chemistry tests and calibrates them to avoid any possible errors.</li> <li>Construct a strong confidence and ability to use all available equipment to perform all medical analyzes</li> </ul>





	<ul style="list-style-type: none"> <li>▪ Performing all tests of biological samples (blood, urine , tissue and feces) to detect and classify microbes that infect the body.</li> <li>▪ Develop a good methods of culturing and growing bacteria</li> <li>▪ Implement the learned stuff practically to reflect the course understanding.</li> </ul>
<b>Course Assessments</b>	Lab Report: 30 % Homework: 10% Practical Exam: 60% A 60 % is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Safety in medical laboratory. Types and uses of different blood test tubes in medical laboratory.
<b>Session 2 (Week 2)</b>	Collection of blood. Separation of serum from blood. Separation of plasma from blood.
<b>Session 3 (Week 3)</b>	Hematology Department: Introduction of Hematology lab.
<b>Session 4 (Week 4)</b>	Types sample and tests in Hematology laboratory. Normal ranges.
<b>Session 5 (Week 5)</b>	Type of anticoagulants in vitro. Bleeding Time, and Prothrombin Time ( PT ).
<b>Session 6 (Week 6)</b>	Clotting Time, and Platelet count.
<b>Session 7 (Week 7)</b>	Bleeding Disorders and Thrombin Time.
<b>Session 8 (Week 8)</b>	Slide preparation and Staining.
<b>Session 9 (Week 9)</b>	Blood film.
<b>Session 10 (Week 10)</b>	Full Blood count.
<b>Session 11 (Week 11)</b>	Biochemistry Department: Introduction of Biochemistry laboratory. Types sample and tests in Biochemistry laboratory.
<b>Session 12 (Week 12)</b>	Determination of Glucose in Blood/Serum, Glucose Tolerance Tests.
<b>Session 13 (Week 13)</b>	Principals of colorimetry & overview of semi analyzer.
<b>Session 14 (Week 14)</b>	Renal Function Tests 24 hr collection, preservation Physical. characteristics, clearance tests.
<b>Session 15 (Week 15)</b>	Glucose Homeostasis, overview DM, HGAIC.
<b>Session 16 (Week 16)</b>	Serum electrolyte Potassium estimations. Estimation of serum Calcium.
<b>Session 17 (Week 17)</b>	Serum and urine creatinine.
<b>Session 18 (Week 18)</b>	Histo-pathology Department: Introduction of Histo-pathology laboratory
<b>Session 19 (Week 19)</b>	Types sample and tests in Histopathology laboratory Demonstration of Histo-pathology techniques Trimming
<b>Session 20 (Week 20)</b>	Tissue embedding Tissue processing
<b>Session 21 (Week 21)</b>	Microtome Staining and Mounting
<b>Session 22 (Week 22)</b>	Microbiology Department:
<b>Session 23 (Week 23)</b>	Introduction of Microbiology laboratory.
<b>Session 24 (Week 24)</b>	Types of sample and tests in Microbiology laboratory
<b>Session 25 (Week 25)</b>	Types of media in microbiology.
<b>Session 26(Week 26)</b>	How to prepare culture media in microbiology.
<b>Session 26 (Week 27)</b>	Types of bacterial culture media.
<b>Session 27 (Week 28)</b>	Revision (equations answering and discussion).





Session 28 (Week 29)	Handling the lab report and final assessment
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Clinical Chemistry: Principles, Procedures, Correlations (Bishop)</li> <li>• Clinical Chemistry By David White, Nigel Lawson, Paul Masters, Daniel McLaughlin 2016, 1<sup>st</sup> edition&gt;</li> <li>• Practical Clinical Biochemistry (Varley).</li> <li>• Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics (Fundamentals of Clinical Chemistry (Tietz)) 7th Edition by Carl A. Burtis PhD, David E. Bruns MD</li> <li>• Additional Resources.handouts and sheets, also some web links may be used in this course provided after any lecture by instructor.</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the pathophysiology of kidney and renal function.</li> <li>• Understand the biochemistry of non-protein nitrogenous substance and clinical significance of them</li> <li>• Discuss the biochemical change of electrolytes with emphasis on their laboratory diagnosis.</li> <li>• Define the term quality assurance</li> <li>• Understand the biochemical aspects of liver disease.</li> <li>• Describe the laboratory methods employed for the analysis of liver function</li> </ul>







- 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.

<b>Course Assessments</b>	Activities 10%                      Midterm exam                      % 20 Attendances 10%                      Final Exam                      %60 A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1&amp;2)</b>	<ul style="list-style-type: none"> <li>•Renal functions and urine formation.</li> <li>• Renal disorders &amp; renal failure</li> </ul>
<b>Session 2 (Week 3&amp;4)</b>	<ul style="list-style-type: none"> <li>• Non protein nitrogenous (Urea method estimation Disease correlation)</li> <li>• NPNs Urea &amp; ammonia significance.</li> </ul> Assignment 2 handed out
<b>Session 3 (Week 5&amp;6)</b>	<ul style="list-style-type: none"> <li>• Creatine &amp; creatinine metabolism, methods of estimation and disease correlation.</li> <li>• Uric acid metabolism ,disorders&amp; methods of determination.</li> </ul>
<b>Session 4 (Week 7&amp;8)</b>	<ul style="list-style-type: none"> <li>•Body fluids</li> <li>• Electrolytes, water , blood volume &amp; osmolality</li> </ul>
<b>Session 5 (Week 9 &amp;10)</b>	<ul style="list-style-type: none"> <li>• Na &amp; K metabolism</li> <li>• Disease correlation, methods of estimation.</li> </ul>
<b>Session 6 (Week 11 &amp;12)</b>	<ul style="list-style-type: none"> <li>• Flame photometer ,principle and component parts</li> <li>• Ion selective electrode for Na &amp; K</li> </ul>
<b>Session 7 (Week 13 &amp; 14)</b>	<ul style="list-style-type: none"> <li>• Calcium metabolism, disease correlation &amp; methods of estimation.</li> <li>• Phosphorous metabolism, method of estimation &amp; disease correlation.</li> </ul>
<b>Session 8 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session9(Week 16&amp;17)</b>	<ul style="list-style-type: none"> <li>• Acid-Base balances</li> <li>• Acid-Base Imbalances and compensation(respiratory).</li> </ul>
<b>Session10(Week18&amp;19)</b>	<ul style="list-style-type: none"> <li>• Acid-Base Imbalances and compensation(metabolic).</li> <li>• Quality control &amp; quality assurance</li> </ul>
<b>Session11(Week20&amp;21)</b>	<ul style="list-style-type: none"> <li>• Liver anatomy ,physiology, function &amp; Classification of jaundice</li> <li>• Liver disorders and manifestations.</li> </ul>
<b>Session12(Week22&amp;23)</b>	<ul style="list-style-type: none"> <li>• Introduction to Enzymology &amp;enzymes with medical significance.</li> <li>• Liver enzymes, Transferases enzymes(ALT, AST).</li> <li>•Liver enzymes(ALP &amp;GGT).</li> </ul>
<b>Session13(Week24&amp;25)</b>	<ul style="list-style-type: none"> <li>• Cardiac biomarkers and enzymes (Ck, AST, LDH, troponin &amp; myoglobin).</li> <li>• Acute myocardial infarction diagnosis</li> </ul>
<b>Session 14(Week 26 &amp;27)</b>	<ul style="list-style-type: none"> <li>• Introduction to hormone (classification and mechanism).</li> <li>• Hypothalamus and pituitary.</li> </ul>
<b>Session 15(Week 28 &amp;29)</b>	<ul style="list-style-type: none"> <li>• Thyroid and parathyroid hormone</li> <li>• Gonads and fertility hormone</li> <li>• Adrenal hormone</li> </ul>
<b>Session 16 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Blood Bank&Blood Transfusion
2	<b>Course Code</b>	ML402
3	<b>Course type: /general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Hematology
7	<b>Program offered the course</b>	Medical Laboratories Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Blood banking and transfusion medicine(second Edition 2003), H Silberstein, N Anderson Roback.</li> <li>• Practical transfusion medicine (2001), M. F Murphy,..et al</li> <li>• Blood banking and transfusion MEDICINE, Second Edition 2007 by C. D. Hillyer, L. E. Silberstein, P. M. Ness, K. C. Anderson J</li> <li>• <a href="https://www.papdi.or.id/pdfs/401/BloodTransfussionGuideLines.pdf">https://www.papdi.or.id/pdfs/401/BloodTransfussionGuideLines.pdf</a></li> <li>• Textbook of blood bankikg and transfusion medicine 2<sup>nd</sup> edition 2005</li> <li>• Modern Blood Banking &amp; Transfusion Practices 7<sup>th</sup> Edition 2018 by Denise M. Harmening PhD MT (ASCP).</li> </ul>







	<ul style="list-style-type: none"> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> <li>• <a href="https://www.dovepress.com/journal-of-blood-medicine-journal">https://www.dovepress.com/journal-of-blood-medicine-journal</a></li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to: differentiation between types of blood groups.</p> <ul style="list-style-type: none"> <li>• Understand molecular information and the nature of blood group antigens.</li> <li>• Identify the medical terms and abbreviations.</li> <li>• Recognize the transfusion reactions.</li> <li>• Identify representations, terms, conditions, and specificity of blood group antigens.</li> <li>• Recognize different methods to follow up factors influencing antigen antibody reactions.</li> <li>• Construct blood products.</li> <li>• Write descriptions of systems of variety of blood groups.</li> <li>• Develop a technique in the lab.</li> <li>• Implement an experiment.</li> </ul>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam                      % 20          Attendances 10%                      Final Exam                      %60          A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	• Introduction to component and nature of blood transfusion.
<b>Session 2 (Week 2)</b>	• Types of clinical significance of blood group antigens.
<b>Session 3 (Week 3)</b>	• Elements of specific antibodies that recognize RBCs antigens
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• ABO antigens</li> <li>• Distribution of ABO system</li> </ul>
<b>Session 5 (Week 5)</b>	• Genetics formations and biochemical synthesis of ABO system
<b>Session 6 (Week 6)</b>	• Immunoglobulins (Antibodies), identification, classifications, functions
<b>Session 7 (Week 7)</b>	• Antigens, immunogenicity, important characteristics which effect haemagglutinations.
<b>Session 8 (Week 8)</b>	<ul style="list-style-type: none"> <li>• Rhesus blood group system</li> <li>• Discovery history, Expression on the body fluids, presence on RBCs</li> <li>Types of D-antigens, molecular information , kinds of D-antibodies</li> <li>Clinical significant reactions of D antigens.</li> </ul>
<b>Session 9 (Week 9-10)</b>	<ul style="list-style-type: none"> <li>• Rhesus blood group system</li> <li>• Discovery history, Expression on the body fluids, presence on RBCs</li> <li>Types of D-antigens, molecular information, kinds of D-antibodies</li> <li>Clinical significant reactions of D antigens.</li> </ul>
<b>Session 10 (Week 11-12)</b>	• Kell blood group system, immunization, genetically instruction, Abs types.
<b>Session 11 (Week 13)</b>	• Diego blood group system, expression, molecular information, common phenotyping, clinical significance of Diego antibodies.
<b>Session 12 (Week 14)</b>	<b>Midterm Exam</b>



<b>Session 13 (Week15-16)</b>	<ul style="list-style-type: none"> <li>• Kidd blood group system, Abs specificity, expression, transfusion reaction.</li> </ul>
<b>Session 14 (Week16-17)</b>	<ul style="list-style-type: none"> <li>• Duffy blood group system, genetically information, general phenotyping,</li> </ul>
<b>Session 15(Week17-18)</b>	<ul style="list-style-type: none"> <li>* Lewis blood group system</li> <li>* Lutheran blood group system</li> </ul>
<b>Session 16 (Week19)</b>	<ul style="list-style-type: none"> <li>• Plasma transfusion, functions, ...clinical uses.</li> <li>blood transfusion, donor selection criteria</li> </ul>
<b>Session 17 (Week20)</b>	<ul style="list-style-type: none"> <li>• Platelets transfusion, preparations, usages, storages,</li> <li>*The H-blood group, common H phenotype, function,H-antigen specificities, H-antibodies,...transfusion reactions.</li> </ul>
<b>Session 18(Week21-22)</b>	<ul style="list-style-type: none"> <li>•MNSs blood group system</li> <li>•P blood group system</li> </ul>
<b>Session 19(Week22-23)</b>	<ul style="list-style-type: none"> <li>*Transfusion reactions, hemolytic transfusion, types (acute or chronic), factors that determine the severity of the disease.</li> <li>*Intravascular Haemolysis and Extravascular Haemolysis.</li> </ul>
<b>Session 20 (Week 24-25)</b>	<ul style="list-style-type: none"> <li>*Febrile non-hemolytic transfusion reaction, White blood cell incompatibility.</li> <li>*Post transfusion purpura (PTP), platelets incompatibility, treatment</li> </ul>
<b>Session 21 (Week 26-27)</b>	<ul style="list-style-type: none"> <li>*Allergic reactions, IgE anti-allergen antibodies</li> <li>*Anaphylaxis</li> <li>*IgA anti-plasma protein antibodies reaction</li> </ul>
<b>Session 22 (Week 28)</b>	<ul style="list-style-type: none"> <li>*Transfusions associated Lung injury (TRALI), donor anti-leukocyte Abs attack.</li> <li>*Transfusion reaction: Non-immune, hypothermia ..., hyperkalemia</li> </ul>
<b>Session 23 (Week 29)</b>	Revision and discussion
<b>Session 24 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• 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</li> <li>• Textbook of Medical Virology 2nd Edition by Baijayantimala Mishra 2002.</li> <li>• Medical Virology 4th Edition by D. E. White, Frank J. Fenner 1994.</li> <li>• Review of Medical Microbiology and Immunology, Warren Levinson, Lange, the McGraw- Hill Companies.</li> <li>• Microbiology-Lippincott's Illustrated Reviews, William A. Strohl, Lippincott's William &amp; Wilkins.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based Power Point Presentation, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <p>Understand Definition of viruses, their characteristics, classification, methods of reproduction, and their spread</p> <p>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.</p> <p>Study the genetic characteristics of the virus and its relationship to the manufacture of vaccines and antivirals</p>





	Recognize the various diseases caused by viruses: their description, methods of transmission, diagnosis, and methods of combating them.
<b>Course Assessments</b>	Activities 10%                      Midterm exam                      % 20 Attendances 10%                      Final Exam                      %60 A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1&amp;2)</b>	<ul style="list-style-type: none"> <li>• Introduction of virology: Structure, Evolution, Host range, Types.</li> <li>• Virus classification, Virus replication, Bacteriophages, Cultivation of viruses, Quantification of viruses</li> </ul>
<b>Session 2 (Week 3&amp;4)</b>	<ul style="list-style-type: none"> <li>• Viral genetics and gene therapy</li> <li>• Gene therapy and recombinant vaccines</li> <li>• Laboratory diagnosis</li> <li>• Pathogenesis of viruses and Host defenses</li> </ul>
<b>Session 3 (Week 5&amp;6)</b>	<ul style="list-style-type: none"> <li>• Antiviral therapy and Viral vaccines</li> </ul>
<b>Session 4 (Week 7&amp;8)</b>	<ul style="list-style-type: none"> <li>• DNA Enveloped Viruses: Herpesviruses, Hepadnaviruses, Poxviruses</li> <li>• DNA non-enveloped viruses : Adenoviruses, Papillomaviruses and Parvoviruses.</li> </ul>
<b>Session5. (Week 9&amp;10)</b>	<ul style="list-style-type: none"> <li>• RNA Enveloped viruses: <ul style="list-style-type: none"> <li>i-Orthomyxoviruses, Influenza;</li> <li>ii-Paramyxoviruses: Mumps, Measles, Respiratory Syncytial virus and Parainfluenza virus</li> </ul> </li> </ul>
<b>Session 6. (Week 11&amp;12)</b>	<ul style="list-style-type: none"> <li>• Coronaviruses: Corona viruses (Covid 19).</li> <li>• Togavirus: Rubella virus.</li> <li>• Rhabdoviruses: Rabies virus</li> <li>• Retroviruses: (i) Human t-Cell Lymphotropic Virus, (ii) Human Immunodeficiency virus (HIV).</li> </ul>
<b>Session 7 (Week 13&amp;14)</b>	<ul style="list-style-type: none"> <li>• RNA non-enveloped viruses: <ul style="list-style-type: none"> <li>I- Picorna viruses: <ul style="list-style-type: none"> <li>A- Enteroviruses:(Poliovirus, Coxsakievirus, Echoviruses and Other Enteroviruses).</li> <li>B- Rhinoviruses; Common cold</li> </ul> </li> </ul> </li> </ul>
<b>Session 8. (Week15)</b>	<b>Mid- Term Exam</b>
<b>Session 9 (Week 16&amp;17)</b>	<ul style="list-style-type: none"> <li>• The serological methods: <ul style="list-style-type: none"> <li>- Hemagglutination and Hemagglutination- inhibition</li> <li>- Agar- gel precipitation test</li> <li>- Virus (serum) neutralization test</li> <li>- Immunofluorescent test-direct and indirect</li> </ul> </li> </ul>
<b>Session 10 (Week 18)</b>	<ul style="list-style-type: none"> <li>• The serological methods: <ul style="list-style-type: none"> <li>- Complement fixation test</li> <li>- Enzyme- Linked Immunosorbent Assay (ELISA)</li> <li>- The polymerase chain Reaction (PCR)</li> </ul> </li> </ul>
<b>Session 11 (Week 19&amp;20)</b>	Caliciviruses, Reoviruses: Rotaviruses Hepatitis viruses , Arboviruses and Tumor viruses.
<b>Session 13 (Week 20&amp;21)</b>	Hemorrhagic fever viruses: <ul style="list-style-type: none"> <li>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</li> </ul> Gastrointestinal tract infections- Viral Diarrheal Diseases Slow viruses infection






<b>Session 14(Week 22&amp;23)</b>	<ul style="list-style-type: none"> <li>• Virus isolation - In chicken embryonated eggs</li> <li>• Signs of virus growth in the inoculated eggs</li> </ul> <p>Calculation of the ID50, LD50, by Reed and Muench method</p>
<b>Session 15.(Week 24&amp;25)</b>	<ul style="list-style-type: none"> <li>• Virus isolation in cell culture</li> <li>- Types of cell cultures</li> <li>- Methods of preparation of a monolayer cell culture</li> <li>- Method of inoculation</li> </ul>
<b>Session 16.(Week 26&amp;27)</b>	<p>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</p>
<b>Session 18 (Week28)</b>	Revision, questions answering and discussion.
<b>Session 18 (Week29)</b>	<b>Practical Final-exam</b>
<b>Session 19 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Basic Cell and Molecular Biology Gerald Bergtrom, University of Wisconsin, Milwaukee Copyright Year: 2018 ISBN 13: 9780996150248</li> <li>• Molecular Biology Techniques A Classroom Laboratory Manual 4th Edition - 2019 Authors: Sue Carson, Heather Miller, Melissa Srougi, D. Scott Witherow ISBN: 9780128180242</li> <li>• Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications Third Edition by Lela Buckingham PhD MB DLM(ASCP) 2019.</li> <li>• Principles and Applications of Molecular Diagnostics by Nader Rifai, A. Rita Horvath, et al. 2018.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
		
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based presentation, group interaction and discussion, and active participation.
<b>Course Objectives:</b>		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.
<b>Course Assessments</b>		Activities 10%                      Midterm exam                      % 20 Attendances 10%                      Final Exam                      %60 A 60% is required for a pass in this course.
<b>Content Breakdown</b>		<b>Topics Coverage</b>
<b>Session 1 (Week 1 - 2)</b>		Introduction to Molecular Diagnosis <ul style="list-style-type: none"> <li>• Definition of molecular biology.</li> </ul>



	<ul style="list-style-type: none"> <li>• Molecular microbiology</li> <li>• Molecular Hematology</li> <li>• Molecular Parasitology</li> <li>• Molecular Oncology</li> </ul> <p>Laboratory Biosafety Guidance in Molecular laboratories</p> <ul style="list-style-type: none"> <li>• Purpose</li> <li>• Risk Assessment</li> <li>• Principal Investigator (PI) Responsibility</li> <li>• Laboratory Hazards.</li> </ul>
<b>Session 2 (Week 3- 5)</b>	<p>Central Dogma</p> <ul style="list-style-type: none"> <li>• Cell and cell types.</li> <li>• Prokaryotes and eukaryotes</li> <li>• Transformation principle</li> </ul> <p>Nucleic Acids Structure</p> <ul style="list-style-type: none"> <li>* DNA structure</li> <li>* RNA Structure</li> <li>* Protein Structure</li> </ul> <p>Histone proteins</p>
<b>Session 3 (Week 6 - 9)</b>	<p>Introductions to DNA Replication</p> <p>From DNA to Protein (Transcription)</p> <p>From DNA to Protein (Translation)</p> <p>Transformation Experiments</p>
<b>Session 4 (Week 10- 12)</b>	<p>Introduction into DNA Damage</p> <p>Clinical features, sources and outcomes of DNA Damage</p> <p>DNA Damage diseases Treatment and Prevention</p>
<b>Session 5 (Week 13 - 14)</b>	<p>DNA-Damage-Repair</p> <p>Types of DNA-Damage-Repair</p>
<b>Session 6 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 7 (Week 16 - 18)</b>	<p>Base Excision Repair</p> <p>Nucleotides Excision Repair</p> <p>Mismatch Repair</p>
<b>Session 8 (Week 19 - 21)</b>	<p>Mutations</p> <p>Plasmid Formation</p> <p>PCR Principle</p>
<b>Session 9 (Week 22- 24)</b>	<p>Convention PCR</p> <p>Real time PCR</p> <p>Protein Electrophoresis</p>
<b>Session 10 (Week 25-27)</b>	<p>DNA Sequencing</p> <p>Maxam/Gilbert chemical sequencing</p> <p>Sanger chain termination sequencing</p>
<b>Session 11 (Week 28)</b>	Hybridization technologies
<b>Session 11 (Week 29)</b>	Revision and discussion
<b>Session 12 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	<p>You should come with appropriate course materials during the lecture and</p> <ul style="list-style-type: none"> <li>• Wear gown during the laboratory activities and never wear gown outside the</li> <li>•laboratory sessions (handouts,</li> </ul>





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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ol style="list-style-type: none"> <li>1. Alexopoulos, C. J.; Mims, C. W., &amp; Blackwell. (1996): Introductory Mycology 4<sup>th</sup>ed. John Wiley and Sons, Inc. USA, ISBN; 0-471-52229-5.</li> <li>2. William, G. M. &amp; Roderick, J. H. (2005): Medical Mycology, 10<sup>th</sup>ed. Hodder Arnold, London. <a href="http://www.hoddereducation.com">http://www.hoddereducation.com</a> . ISBN; 13-978-0-340-80912-9.</li> <li>3. Kwon-Chung, K.J. &amp; Bennett, J. E. (1992): Medical Mycology. Lea and Febiger, Philadelphia, PA, USA. ISBN; 0-8121-1463-9.</li> <li>4. de-Hoog, G. S.; Cuarro, J.; Gene, J. &amp; Figueras, M. J. (2000): Atlas of Clinical Fungi, 2<sup>nd</sup> ed. Schimmelcultures, Utrecht, The Netherlands and Universitat Rovira; Virgili, Reus, Spain. ISBN; 90-70351-43-9.</li> </ol>



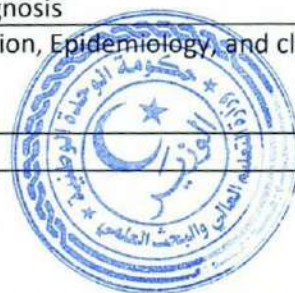


	<p>5. Ellis, D.; Davis, S.; Alexiou, H.; Handke, R. &amp; Bartley, R. (2007): Description of medical fungi, 2<sup>nd</sup>ed. Mycology unit. Women's and children's hospital. North Adelaide, Australia. ISBN; 9780959851267 (pbk.).</p> <p>7. Book Title &amp; ISBN:</p> <p>1) Reiss E , Shadomi HJ, Lyon GM. 2012. Fundamental Medical Mycology. Wiley-Blackwell. ISBN: 978-0-470-17791-4</p> <p>8. Additional Resources:</p> <p>2) The recommended textbook is : Richardson MD, Warnock DW. 2004. Fungal infection: Diagnosis and Management. Wiley. ISBN: 9781405115780</p> <p>3) handouts: Lecture handouts</p>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Definition of FUNGI, their characteristics, classification, methods of reproduction, and their spread.</li> <li>• Provide students with an overview of the major fungus diseases or mycoses that threaten animal and human health.</li> <li>• Study the definitions and fungal terminology.</li> <li>• Identify the causal agents, symptoms, modes of infections, prognosis, and treatment of fungus-related illness that will be discussed and explored in detail.</li> <li>• Recognize the general aspects of fungal immunology and pathology.</li> <li>• 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.</li> <li>• Recognize the various diseases caused by fungi: their description, methods of transmission, diagnosis, and methods of combating them.</li> </ul>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam                      % 20</p> <p>Attendances 10%                      Final Exam                      %60</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<p><b>Introduction to Mycology</b></p> <p>Definition, General Characters, Nutrition, Economic Importance, Reproduction, and Classification of fungi.</p>
<b>Session 2 (Week2,3)</b>	<p><b>Introduction to Medical Mycology</b></p> <p>Definitions and Fungal Terminology Educational objectives. Human Immunity and defenses against the infestation of fungi. Diagnosis of fungal infections Clinical Observation. Laboratory investigation.</p>





Session 3 (Week 4)	<b>Classification of Important Medical Fungi (fungal diseases):</b> 1- Superficial (cutaneous) mycoses. 2- Subcutaneous and deep (Systemic) mycoses. The major tissue reactions observed with fungal infection.
Session 4(Week 5)	<b>Dermatomycosis:</b> - 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)	<i>Scytalidium</i> 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.






<b>Session23(Week 24)</b>	Types of fungal toxins: <ul style="list-style-type: none"> <li>* Gliotoxin., Aflatoxins, Ochratoxin, Fumonisin, T-2 Toxin, Deoxynivalenol, Patulin</li> <li>* Understanding of fungal toxins and how they contribute to the modulation of host immunity.</li> </ul>
<b>Session24(Week 25)</b>	Antifungal therapeutic agents. Antifungal drugs and Targets. Polyene antibiotics; Amphotericin B (Fungizone). Natamycin (Natacyn). Nystatin (Mycostatin).
<b>Session25(Week 26)</b>	1- Imidazole and Triazole compounds: <ol style="list-style-type: none"> <li>Fluconazole (Difucan).</li> <li>Itraconazole (Sporanox).</li> <li>Ketoconazole (Nizoral).</li> </ol> Other imidazole compounds for topical treatment such as Bifonazole, clotrimazole, Isoconazole-NO <sub>3</sub> , Oxiconazole ...etc.
<b>Session26(Week 27)</b>	2- Allylamines: <ol style="list-style-type: none"> <li>Terbinafine (Lamisil).</li> <li>Naftifine-HCL.</li> </ol> Echinocandins.
<b>Session27(Week 28)</b>	3- Miscellaneous systemic antifungal agents: <ol style="list-style-type: none"> <li>Flucytosine (Ancobon).</li> <li>Griseofulvin (Fulvicin).</li> </ol> Other Miscellaneous topical antifungal agents such as Amorolfine hydrochloride, Ciclopyrox, Haloprogin ...etc.
<b>Session28(Week 29)</b>	Revision (questions answering and discussion).
<b>Session29(Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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 hour 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
<b>Brief Description:</b> 		<p>This course is divided into 4 main sections: Blood banking, clinical chemistry, microbiology and immunology.</p> <p>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.</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Christopher D. Hillyer</li> <li>• Practical Clinical Biochemistry (Varley).</li> <li>• Hess, J. R.; Biomedical Excellence for Safer Transfusion (BEST) Collaborative (2012). "Scientific problems in the regulation of red blood cell products". <i>Transfusion</i>. 52 (8): 1827–35. doi:10.1111/j.1537-2995.2011.03511.x. PMID 22229278</li> <li>• <a href="http://www.laboratories.org/Patients/Basics/Banking.aspx">http://www.laboratories.org/Patients/Basics/Banking.aspx</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		6 * 28 = 168 teaching hours
<b>Delivery</b>		<p>-Practical Training</p> <p>-Tutorials</p> <p>-Group interaction and discussion</p> <p>-Self-directed activities (Write a detailed report on the practical side)</p> <p>-Laboratory experiments (training in the lab)</p>
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Familiarize the student with the components, properties and composition of blood as well as the system of different blood groups</li> <li>• Identify the types of blood types present and how to identify them</li> <li>• Recognize the causes and consequences of wrong and unsafe blood transfusions and the consequences of that.</li> </ul>



	<ul style="list-style-type: none"> <li>• Identify the correct mechanisms for receiving patient samples and methods of dealing with them</li> <li>• Recognize all types of analyzes for all parts of the body and how to perform them in the laboratory.</li> <li>• Understands the accuracy of the results of blood chemistry tests and calibrates them to avoid any possible errors.</li> <li>• Construct a strong confidence and ability to use all available equipment to perform all medical analyzes</li> <li>• Performing all tests of biological samples (blood, urine and feces) to detect and classify microbes that infect the body.</li> <li>• 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</li> <li>• Implement the learned stuff practically to reflect the course understanding.</li> </ul>
<b>Course Assessments</b>	Daily Assessments and homework: 20% Lab Report: 50 % Practical Exam in the lab: 30% A 60 % is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1&amp;2)</b>	<ul style="list-style-type: none"> <li>• <b>Blood Bank Department</b></li> <li>• Learning the safety guidelines followed in blood bank lab</li> <li>• ABO system of different blood groups and how to conduct tests to identify them</li> <li>• Identify Rh blood system</li> </ul>
<b>Session 2 (Week 3&amp;4)</b>	<ul style="list-style-type: none"> <li>• The correct and safe methods for blood transfusion.</li> <li>• Transfusion the main blood components (serum, plasma and cells) to the patient</li> </ul>
<b>Session 3 (Week 5&amp;6)</b>	<ul style="list-style-type: none"> <li>• Conduct of blood transfusion compatibility tests</li> <li>• Cross match</li> <li>• Coombs test (direct &amp; indirect)</li> </ul>
<b>Session 4 (Week 7&amp;8)</b>	<ul style="list-style-type: none"> <li>• Blood donation methods</li> <li>• Anticoagulants in the blood bags</li> <li>• Identifying the reasons that lead to blood cells clogging in the event of an incorrect blood transfusion</li> <li>• Saving blood and blood derivatives correctly</li> </ul>
<b>Session 5 (Week 9&amp;10&amp;11)</b>	<ul style="list-style-type: none"> <li>• <b>Clinical Chemistry Department</b></li> <li>• Learning the safety guidelines followed in Clinical Chemistry lab.</li> <li>• Identify the correct mechanisms for receiving patient samples in the Department of Clinical Chemistry</li> <li>• Working all types of analyzes for all organs of the body (kidney, liver, heart, etc.)</li> </ul>
<b>Session 6 (Week 12&amp;13)</b>	<ul style="list-style-type: none"> <li>• Practicing the different methods (primitive manual and modern systemic) for conducting medical tests</li> <li>• Ensure the accuracy of the results of blood chemistry tests</li> </ul>
<b>Session 7 (Week 14 &amp;15)</b>	<ul style="list-style-type: none"> <li>• Calibrate the used machines in the lab to avoid any possible errors</li> <li>• Apply the quality controls for all the tests to achieve reliable results</li> <li>• the implementation of quality control in clinical chemistry lab.</li> </ul>
<b>Session 8 (Week 16)</b>	<b>(handing the draft of lab report)</b>
<b>Session 9 (Week 17 &amp;18)</b>	<ul style="list-style-type: none"> <li>• <b>Department of Immunology</b></li> <li>• Learning the safety guidelines followed in Immunology lab.</li> </ul>



	<ul style="list-style-type: none"> <li>• Identify the correct mechanisms for receiving patient samples in the Department of immunology</li> <li>• Identify the immune response of the body though measuring the WBCs counts.</li> </ul>
<b>Session 10 (Week 19)</b>	<ul style="list-style-type: none"> <li>• Antibody-antigen reactions tests</li> <li>• Serology tests (ASO, RH-factor)</li> </ul>
<b>Session 11 (Week 20&amp;21)</b>	<ul style="list-style-type: none"> <li>• Performing practically all the following tests ELISA, Antigen-Antibody interaction, C-reactive protein and Flow cytometry</li> <li>• Identify the dilution methods used in studying the proportion of the amount of foreign bodies in the body.</li> </ul>
<b>Session 12 (Week 22&amp;23)</b>	<ul style="list-style-type: none"> <li>• <b>Microbiology department</b> Learning the safety guidelines followed in Microbiology lab.</li> <li>• Identify the different microbes that infect the body</li> <li>• Conducting all tests for biological samples (blood, urine and feces) to detect and classify microbes that infect the body.</li> </ul>
<b>Session 13 (Week 24&amp;25)</b>	<ul style="list-style-type: none"> <li>• Preparation the media for bacterial culture dishes</li> <li>• Learn how to grow and grow bacteria to help diagnose and treat disease</li> </ul>
<b>Session 14 (Week 26&amp;27)</b>	<ul style="list-style-type: none"> <li>• Conducting biochemical distance tests to differentiate between different types of bacteria and fungi</li> <li>• Conduct an antibiotic sensitivity test to be able to choose the appropriate antibiotic to eliminate microbes.</li> </ul>
<b>Session 15 (Week 28)</b>	<ul style="list-style-type: none"> <li>• Isolation the colonies of bacteria from different sources and growing it in different agars.</li> <li>• Learn about the different sterilization methods to avoid infection and the spread of microbes.</li> </ul>
<b>Session 16 (Week 29)</b>	<b>Handling the lab report for assessment</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Ivan M. Roitt, J. Brostoff and D. K. Male, Immunology, Gower Medical Publishing, London.1993.</li> <li>• Clark WR, The experimental foundations of modern immunology. John Wiley and Sons Inc. New York. 1991.</li> <li>• Janis Kuby, Immunology, II edition. W. H. Freeman and Company, New York. 1993.</li> <li>• Janeway Travers, Immunobiology- the immune system in health and disease. Current Biology Ltd. London, New York. 3rd ed.,1997.</li> <li>• Peter J. Delves, Ivan M. Roitt, Encyclopedia of Immunology; Academic Press. 2 nd Ed., 1998.</li> <li>• Chapel H and Halbey M, Essentials of Clinical Immunology. ELBS. 1986. Medical Parasitology by K.J. Ryan</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	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.
<b>Course Objectives:</b>	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.



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






<b>Session 27 (week 27)</b>	Immunization: Passive and active Vaccines-Introduction
<b>Session 28 (Week 28)</b>	Types and applications, DNA vaccines, Polyclonal antibodies and monoclonal antibodies. Assessment • Presentation
<b>Session 29 (Week 29)</b>	Revision and discussion
<b>Session 30 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<p><b>Brief Description:</b></p> 	<p>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.</p>
<p><b>Textbooks required for this Course:</b></p>	<ul style="list-style-type: none"> <li>• Clinical Laboratory Management, Lynne S. Garcia. American Society for Microbiology</li> <li>• Clinical Diagnosis AND Management BY Laboratory Methods, Richard A. McPherson. Elsevier Inc.</li> <li>• Laboratory Quality Management System Handbook, World Health Organization 2011</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> <li>• <a href="https://www.sapiosciences.com/clinical-lab">https://www.sapiosciences.com/clinical-lab</a></li> </ul>
<p><b>Course Duration</b></p>	<p>4 * 28 = 112 teaching hours</p>
<p><b>Delivery</b></p>	<p>Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.</p>
<p><b>Course Objectives:</b></p>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to procedure laboratory statistics</p> <ul style="list-style-type: none"> <li>• At the end of the school year, the student would be familiar with facilities and safety in laboratory</li> <li>• At the end of the school year, the student would be familiar with the principles of instrumentation</li> <li>• The student would be able to understand the statistical methods used in laboratory</li> </ul>
<p><b>Course Assessments</b></p>	<p>Activities and homework 10%</p>



	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.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
Session 1 (Week 1)	Introduction to laboratories Quality Control
Session 2 (Week 2)	International laboratory standards
Session 3 (Week 3-4)	<ul style="list-style-type: none"> <li>Quality Control Assurance Definition &amp; Introduction</li> <li>Laboratory Quality Control Pre-Analytical Phase</li> </ul>
Session 4 (Week 5 -7)	<ul style="list-style-type: none"> <li>Laboratory Quality Control Analytical Phase</li> </ul>
Session 5(Week 8-9)	<ul style="list-style-type: none"> <li>Laboratory Quality Control Post-Analytical Phase</li> </ul>
Session6(Week 10)	<ul style="list-style-type: none"> <li>Sources Of Laboratory Errors Pre-Analytical Phase</li> </ul>
Session 7(Week 11)	<ul style="list-style-type: none"> <li>Sources Of Laboratory Errors Analytical Phase</li> <li>Post-Analytical Phase</li> </ul>
Session 8(Week 12-13)	<ul style="list-style-type: none"> <li>Terms &amp; Definitions In Quality Control Accuracy, Precision, Repeatability, Reproducibility, Specificity, Sensitivity.</li> </ul>
Session9(Week 14)	<ul style="list-style-type: none"> <li>Statistical Tools In Quality Control Introduction &amp; Definitions               <ul style="list-style-type: none"> <li>Normal Distribution</li> <li>Measures of center:                   <ul style="list-style-type: none"> <li>Mean</li> <li>Median Value</li> <li>Mode Value</li> </ul> </li> </ul> </li> </ul>
Session10(Week 15)	<ul style="list-style-type: none"> <li>Measure of spread of the data around the mean.               <ul style="list-style-type: none"> <li>Standard Deviation</li> <li>Coefficient of Variation</li> <li>Standard Deviation Index</li> </ul> </li> </ul>
Session11(Week16)	<ul style="list-style-type: none"> <li>Quality Control In Laboratory               <ul style="list-style-type: none"> <li>Internal Quality Control</li> <li>External Quality Control</li> </ul> </li> </ul>
Session12(Week 17)	<ul style="list-style-type: none"> <li>Quality Control Charts The Levey Jennings(L-J) Chart &amp; Westgard Rules.</li> </ul>
Session13(Week 18)	<ul style="list-style-type: none"> <li>Water Baths,</li> <li>Heating Blocks, Dry-Bath Incubators, And Ovens,</li> <li>Mixing,</li> <li>Aqueous Solution,</li> </ul>
Session14(Week 19-20)	<ul style="list-style-type: none"> <li>Mass spectrometry and applications</li> </ul>
Session15(Week 21)	<ul style="list-style-type: none"> <li>Laboratory statistics</li> <li>Preparing to analyze data</li> </ul>
Session16(Week 22)	<ul style="list-style-type: none"> <li>Descriptive statistics</li> </ul>
Session17(Week23-24)	<ul style="list-style-type: none"> <li>Comparative statistics</li> <li>Analyzing discrete data: testing proportions</li> </ul>





	<ul style="list-style-type: none"> <li>○ Trend evaluation and correlative statistics</li> </ul>
<b>Session18(Week 25-26)</b>	<ul style="list-style-type: none"> <li>● Process control—sample management</li> <li>○ The laboratory handbook</li> <li>○ Collection and preservation</li> </ul>
<b>Session19(Week 27,28)</b>	<ul style="list-style-type: none"> <li>○ Sample processing</li> <li>○ Sample storage, retention and disposal</li> <li>○ Sample transport</li> </ul>
<b>Session20(Week 29)</b>	Revision and discussion
<b>Session21 (Week30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Essentials of Human Anatomy &amp; Physiology by Elaine Marieb 10th Edition or later (recommended).</li> <li>• Human Anatomy &amp; Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn.</li> <li>• Introduction to the Human Body, 10th Edition</li> <li>• Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Describe the major cavities of the body and the organs they contain.</li> </ul>






	<ul style="list-style-type: none"> <li>• Explain what a cell is? and explain how human organs and systems interact.</li> <li>• Describe the major functions of the four types of human tissue.</li> <li>• List the major systems of the body, the organs they contain and the functions of those systems.</li> <li>• Define the terms anatomy and physiology.</li> <li>• Define homeostasis.</li> <li>• Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1-2)</b>	<ul style="list-style-type: none"> <li>• Introduction to Anatomy</li> <li>• Levels of organization</li> <li>• Body regions, planes, and orientations and body cavities</li> </ul>
<b>Session 2 (Week 3-4)</b>	<ul style="list-style-type: none"> <li>• Skeletal system</li> <li>• Bone structure and types, cartilage, ligaments, tendons, and joints</li> <li>• Axial and appendicular skeletons</li> <li>• Scientific terminologies of the main body bones</li> </ul>
<b>Session 3 (Week 5-6)</b>	<ul style="list-style-type: none"> <li>• Muscular system</li> <li>• Types of muscles, Differences and their microscopic structure</li> <li>• Skeletal muscle structure and neuromuscular junction</li> <li>• Scientific terminologies of the main body Muscles</li> </ul>
<b>Session 4 (Week 7-9)</b>	<ul style="list-style-type: none"> <li>• Cardiovascular (Circulatory) system</li> <li>• Components of cardiovascular system and types of circulations</li> <li>• The heart, arteries, veins, capillaries, and lymphatic vessels</li> <li>• The blood components (plasma and blood cells)</li> <li>• Scientific terminologies of the main cardiovascular components</li> </ul>
<b>Session 5 (Week 10-11)</b>	<ul style="list-style-type: none"> <li>• Respiratory system</li> <li>• Upper respiratory system (nose, pharynx, larynx, and trachea)</li> <li>• Lower respiratory system (Lungs, thoracic cage, and pleura)</li> <li>• Bronchi, bronchioles, alveoli and respiratory membrane</li> <li>• Respiratory muscles and lung volumes and capacities</li> <li>• Scientific terminologies of the main respiratory system parts</li> </ul>
<b>Session 6 (Week 12-14)</b>	<ul style="list-style-type: none"> <li>• Digestive system</li> <li>• Upper digestive system (mouth, pharynx, and esophagus)</li> <li>• Lower digestive system (stomach, small intestine, and large intestine)</li> <li>• Structure of digestive system walls</li> <li>• Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gall bladder)</li> <li>• Scientific terminologies of the main Digestive system parts</li> </ul>
<b>Session 7 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 8(Week 16-17)</b>	<ul style="list-style-type: none"> <li>• Integumentary system</li> <li>• Skin structure and types</li> <li>• Skin layers and skin color</li> <li>• Receptors and glands</li> <li>• Skin burns and disorders</li> </ul>





	<ul style="list-style-type: none"> <li>• Scientific terminologies of the main skin structures</li> </ul>
Session 9 (Week 18-19)	<ul style="list-style-type: none"> <li>• Urinary system</li> <li>• The main parts of the urinary system</li> <li>• Kidney structure</li> <li>• Nephron and Glomerulus</li> <li>• Types of blood vessels in the kidney</li> <li>• Uterus, bladder and urethra</li> <li>• Scientific terminologies of the main urinary system parts</li> </ul>
Session 10 (Week 20-22)	 <ul style="list-style-type: none"> <li>• Endocrine system</li> <li>• Endocrine glands names and locations</li> <li>• Structure, location, and hormones of hypothalamus and pituitary gland</li> <li>• Structure, location, and hormones of thyroid and parathyroid glands</li> <li>• Structure, location, and hormones of pineal and thymus glands</li> <li>• Structure, location, and hormones of pancreas and adrenal glands</li> <li>• Structure, location, and hormones of the ovaries and testicles gland</li> <li>• Structure, location, and hormones of other glandular structures</li> <li>• Scientific terminologies of the main endocrine glands</li> </ul>
Session 11 (Week 23-24)	<ul style="list-style-type: none"> <li>• Reproductive system</li> <li>• Reproductive systems of male and female</li> <li>• Structure and hormones of the ovaries and testes</li> <li>• Production of the sperms and ova</li> <li>• Scientific terminologies of the main parts of reproductive system parts</li> </ul>
Session 12 (Week 25-26)	<ul style="list-style-type: none"> <li>• Central Nervous system</li> <li>• brain, spinal cord, &amp; peripheral nerves</li> <li>• Neurons (types and structure)</li> <li>• Neurotransmitters and synapses</li> <li>• Scientific terminologies of the main parts of the central nervous system parts</li> </ul>
Session 13 (Week 27-28)	<ul style="list-style-type: none"> <li>• Autonomic Nervous system</li> <li>• Sympathetic and parasympathetic autonomic nervous system</li> <li>• Preganglionic and postganglionic neurons</li> <li>• Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system</li> <li>• Scientific terminologies of the main parts of the autonomic nervous system parts</li> </ul>
Session 14 (Week 29)	Revision and discussion
Session 15 (Week 30-32)	<b>Final Exam</b>
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.
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## 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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Lippincott's Illustrated Reviews: Biochemistry. ISBN-13: 978-1496344496 ISBN-10: 1496344499.</li> <li>• Harper's Illustrated Biochemistry. ISBN-13: 978-1259837937. ISBN-10: 1259837939.</li> <li>• Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148.</li> <li>• Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840.</li> <li>• Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> <li>• <a href="http://www.kume.edu/biochemistry/resource.html">http://www.kume.edu/biochemistry/resource.html</a></li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis.</li> <li>• 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.</li> </ul>






	<ul style="list-style-type: none"> <li>• Use the tools used in biochemistry, and their potential applications to medical technology science.</li> <li>• Utilize the commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals.</li> <li>• Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body.</li> <li>• Identify and explain the structure and functions of each body system.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	• Introduction and definition of biochemistry
<b>Session 2 (Week 2)</b>	Biochemistry of the cell
<b>Session 3 (Week 3&amp;4)</b>	• Body fluids of the cell
<b>Session 4 (Week 5 &amp; 6)</b>	• biochemistry of the cell
<b>Session 5(Week 7,8)</b>	• Chemistry of Carbohydrate
<b>Session6(Week 9)</b>	• Nucleotide
<b>Session 7(Week 10)</b>	• Nucleic acid
<b>Session 8(Week 11)</b>	• Chemistry of Lipids
<b>Session9(Week 12)</b>	<b>Midterm Exam</b>
<b>Session10(Week 13)</b>	• Chemistry of Lipids
<b>Session11(Week 14 &amp; 15)</b>	<b>Midterm practical exam</b>
<b>Session12(Week 16)</b>	•Enzymes
<b>Session13(Week 17)</b>	• Porphyrins
<b>Session14(Week 18 &amp; 19)</b>	Hemoglobin
<b>Session15(Week 20)</b>	•Vitamins
<b>Session16(Week 21)</b>	Revision of lecture
<b>Session17(Week22 &amp; 23)</b>	•Carbohydrate Metabolism
<b>Session18(Week 24 &amp; 25)</b>	•Lipid metabolism
<b>Session19(Week 26,27)</b>	•Protein Chemistry and Metabolism
<b>Session20(Week 28)</b>	Revision of lecture
<b>Session21 (Week 29)</b>	<b>Final practical Exam</b>
<b>Session22 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b> 		<p>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&amp; muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Textbook of medical physiology / Arthur C. Guyton, John E. Hall. —11th ed. ISBN 0-7216-0240-1</li> <li>• Principles of anatomy and physiology/Arthur Gerard J., Bryan D. – 12<sup>th</sup> ed. ISBN 978-0-470-08471-7</li> <li>• Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul> <p>Microbiology text book can be used,</p>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		<p>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.</p>
<b>Course Objectives:</b>		<p>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:</p> <ul style="list-style-type: none"> <li>• Have sufficient basic knowledge in medical physiology.</li> <li>• Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.</li> </ul>



	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Understand and demonstrate the interrelations of the organ systems to each other.</li> <li>• Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses.</li> <li>• Explain the pathophysiology of common diseases related to the organ systems of the body</li> <li>• The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	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)
<b>Session 2 (Week 2)</b>	Autonomic Nervous System ● Types Autonomic Nervous System ● Chemical neurotransmitters ● Function of sympathetic & Parasympathetic Assignment 2 handed out
<b>Session 3 (Week 3)</b>	The blood: ● Major components and function of the blood ● Red & white blood cells ● Plasma protein and function
<b>Session 4 (Week 4)</b>	● Blood groups & hemostasis Blood clotting disorders
<b>Session 5 (Week 5)</b>	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)	<b>Mid exam</b>
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





	<ul style="list-style-type: none"> <li>• Explain regulation of stomach emptying &amp; the composition, function and • regulation of gastric secretions</li> <li>• Vomiting reflex</li> </ul>
<b>Session23 (Week 24)</b>	<ul style="list-style-type: none"> <li>• Gall bladder and biliary tract</li> <li>• intestinal motility</li> <li>• Defecation reflex</li> </ul>
<b>Session25 (Week 25,26)</b>	Urinary system <ul style="list-style-type: none"> <li>• The kidney</li> <li>• Urine formation</li> <li>• Micturition</li> <li>• Renal failure</li> <li>• Male reproductive</li> <li>• Female reproductive</li> </ul>
<b>Session26 (Week 27,28)</b>	Endocrine System Pituitary gland Thyroid gland Parathyroid Adrenal gland Endocrine cell in other organs
<b>Session27 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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%
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		<p>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.</p> <p>Second part of the course will cover different teaching methods and techniques.</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Textbook of Medical Psychology Hardcover – January 1, 1961</li> <li>• <a href="https://bookauthority.org/books/best-medical-psychology-books">https://bookauthority.org/books/best-medical-psychology-books</a></li> <li>• <a href="https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4">https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4</a></li> <li>• Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001.</li> <li>• Armstrong, Thomas. Multiple Intelligences in the Classroom: 2<sup>nd</sup> Edition. Association for Supervision and Curriculum Development, 2000.</li> <li>• Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997.</li> <li>• Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003.</li> <li>• Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002.</li> <li>• Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.</li> </ul>





	<ul style="list-style-type: none"> <li>Teaching Techniques for Church Education. Evangelical Training Association, 1983.</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Up on completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>Understand the principle domains of psychology that are most relevant to medicine.</li> <li>Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings.</li> <li>Be familiar with the application of psychology in the wider practice of medicine.</li> <li>understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses.</li> <li>Will be able to define and list the fruits of the spirit.</li> <li>The student will be able to explain why the fruit of the spirit are important to believers.</li> <li>The student will be able to assess which fruits are most and least evident in their own lives.</li> <li>The student will develop a plan to practice more of the fruit of the spirit for the next week</li> <li>Understand the basics of the teaching methods</li> <li>Know different techniques of teaching and questions preparations.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An introduction to Medical psychology
<b>Session 2 (Week 2)</b>	Psychology and Medicine <ul style="list-style-type: none"> <li>Explain what the field of Psychology studies.</li> <li>Describe the different areas of Psychology.</li> <li>Describe the way by which Psychology is linked to Medicine.</li> </ul>
<b>Session 3 (Week3-4)</b>	Brain Mechanisms and Behaviour <ul style="list-style-type: none"> <li>Describe the basics of Neural Communication.</li> <li>Explain the Basic Structure and function of the Nervous system.</li> <li>Outline the link between biology and behavior.</li> </ul>
<b>Session 4 (Week 5)</b>	Senses and Integration on Senses <ul style="list-style-type: none"> <li>Describe the role and the importance of the different types of senses.</li> <li>Outline the main functional theories of vision.</li> <li>Outline the main functional theories of audition.</li> <li>Outline the main theories of somatosensation.</li> <li>Outline the main theories of the functions of smell</li> </ul>





<b>Session5 (Week 6)</b>	<ul style="list-style-type: none"> <li>• Perception, attention and Memory</li> <li>• Outline the role of the different types of perception.</li> <li>• Describe the main theories of visual perception.</li> <li>• Describe the main theories of auditory perception.</li> <li>• Outline the main types of attention.</li> <li>• Describe the main theories of attention.</li> <li>• Outline the main types of memory.</li> <li>• Describe the main theories of memory</li> </ul>
<b>Session 6 (Week 7)</b>	<p>Child Development (from birth to adolescence)</p> <ul style="list-style-type: none"> <li>• Describe the different stages of development from birth to adolescence.</li> <li>• Outline the main theories of child development.</li> <li>• Outline the main theories of early stages of language acquisition.</li> <li>• Describe the main theories of language development.</li> <li>• Outline the theories connecting language and cognition.</li> <li>• Language and the brain.</li> </ul>
<b>Session 7(Week 8)</b>	<p>Language, Motivation and Emotions</p> <p>Individual Differences in Intelligence and Personality</p> <ul style="list-style-type: none"> <li>• Outline the area of Motivation.</li> <li>• Outline the way by which motivation is link with emotion.</li> <li>• Outline the main theories of Emotions.</li> <li>• Describe the biological theories of emotions.</li> <li>• Describe the psychological theories of emotions.</li> <li>• Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools.</li> <li>• Outline the main Psychometric tools and their role in diagnosis.</li> <li>• Outline the main Personality tests and their value in clinical assessment.</li> </ul>
<b>Session 8 (Week 9)</b>	<p>Adulthood and Sexual Behaviour</p> <ul style="list-style-type: none"> <li>• Describe the characteristics of Adulthood.</li> <li>• Outline the interconnection between psychological and biological characteristics of this stage of human development.</li> <li>• Distinguish between Psychoanalytic and Psychological views on sexuality.</li> <li>• Describe the role of sex in human relationships</li> <li>• Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.</li> </ul>
<b>Session 9 (Week 10)</b>	<ul style="list-style-type: none"> <li>• Sleep, Consciousness, Family Aging, Death and Bereavement</li> <li>• Explain the different stages of sleep as described by EEG studies</li> </ul> <p>Outline the three theories of sleep.</p> <ul style="list-style-type: none"> <li>• Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation.</li> <li>• Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.</li> </ul>





	<ul style="list-style-type: none"> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> </ul>
<b>Session 10 (Week 11)</b>	<p>Psychology and Medicine: Patients and Doctors</p> <ul style="list-style-type: none"> <li>• Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions.</li> <li>• Outline the Biomedical and the Biopsychosocial Approaches to Medicine.</li> <li>• Identify the advantages and disadvantages of each approach in the development of modern medicine.</li> <li>• Outline the impact of psychological principles in doctor patient contact and communication.</li> </ul>
<b>Session 11 (Week 12)</b>	<p>Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment</p> <ul style="list-style-type: none"> <li>• Describe the different factors contributing to the impact that hospitalisation has on people.</li> <li>• Describe the potential psychological impact that hospitalisation may have on people.</li> <li>• Outline the role of psychosocial approaches in medical practice.</li> <li>• Outline the role of placebo effect in the treatment of both physical and psychological treatments.</li> <li>• Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis.</li> <li>• Outline the way by which psychological factors contribute to the development of somatic problems.</li> <li>• Describe different types of psychosomatic problems.</li> <li>• Outline possible ways of distinguishing between psychosomatic and physical problems.</li> </ul>
<b>Session 12 (Week 13)</b>	<p>Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation</p> <ul style="list-style-type: none"> <li>• Outline the psychological factors contributing to coping with illness and disability.</li> <li>• Describe the different approaches and techniques employed for coping with these difficulties.</li> <li>• Outline the different areas of Psychopathology.</li> <li>• Outline the methods employed in the diagnosis of psychological and psychiatric disorders.</li> <li>• Outline the treatments often used in the treatment of psychiatric and psychological disorders.</li> <li>• Explain what is meant by chronic mental illness and the process of rehabilitation.</li> </ul>
<b>Session 14 (Week 14)</b>	<b>Midterm Exam</b>





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)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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:		<ul style="list-style-type: none"> <li>• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير</li> <li>• مقدمة في زراعة الاعضاء، د. الهادي عصمان</li> <li>• WMA medical ethics manual 2015</li> <li>• <a href="#">Principles of Biomedical Ethics, 5th edn.</a></li> <li>• <a href="https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4">https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4</a></li> </ul>
Course Duration		2 * 28 = 56 teaching hours
Delivery		Lectures, Problem based learning and Class discussion.
Course Objectives:		<p>This course introduces medical technology students to the field of medical ethics. The objective of the course is:</p> <ul style="list-style-type: none"> <li>• To convey to students, the pivotal role ethics holds in medical practice.</li> <li>• It introduces the key underlying ethical principles required in medicine.</li> <li>• The application of these principles will be brought to life through case based learning (CBL).</li> <li>• Recognize ethical issues when they arise in their practice</li> <li>• Deal with these issues in a systematic manner</li> <li>• Understand the ethics of medical research</li> <li>• To create an awareness on medical Ethics and Human Values.</li> <li>• To instill Moral and Social Values and Loyalty</li> <li>• To appreciate the rights of others.</li> </ul>
Course Assessments		<p>Midterm exam 20 %    Activity 10 %            Attendance 10 %    Final Exam 60 %            A 60% is required for a pass in this course.</p>
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)	<b>Med term exam</b>
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)	<b>Final Exam</b>
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
<b>Brief Description:</b>		<p>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:</p> <p>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</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2).</li> <li>Buchbinder, S.B., &amp; Shanks, N.H. (2012). Introduction to Health Care Management Jones &amp; Bartlett, Publishers, 2nd Edition.</li> <li>Essential Textbook of Health Management 2. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8.</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		2 * 28 = 56 teaching hours
<b>Delivery</b>		A Lecture-based ppt and practical training B Group interaction and discussion
<b>Course Objectives:</b>		<p>Up on completion of the course the students will be able to:</p> <ul style="list-style-type: none"> <li>Learn concepts and theories in health care management;</li> <li>Develop skills in using materials tools and/or technology central to health care mgt;</li> <li>Learn to understand perspectives and values of health care management;</li> <li>Develop the basic management skills and ability to work productively with others;</li> </ul>





	<ul style="list-style-type: none"> <li>• Learn to select, use, and critically analyze current HCMN research and literature;</li> <li>• Integrate health care management theory with real world situations</li> <li>• Develop the ability to work productively with others in diverse teams.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An Introduction to the Health management
<b>Session 2 (Week 2)</b>	The historical role of medical and nursing health services
<b>Session 3 (Week 3)</b>	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
<b>Session 6(Week 6)</b>	Hospital concept and classification hospital environment
<b>Session 7 (Week 7)</b>	Hospital health planning
<b>Session 8 (Week 8)</b>	The organizational structure of the hospital
<b>Session 9(Week 9)</b>	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
<b>Session 10(Week 10)</b>	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
<b>Session 11(Week 11)</b>	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
<b>Session 12(Week 12)</b>	Leadership and management An overview of healthcare management and leadership
<b>Session 13(Week 13)</b>	Management and motivation
<b>Session 14(Week 14)</b>	<b>Midterm Exam</b>
<b>Session 15(Week 15)</b>	Organizational Behavior (OB) and Management Thinking
<b>Session 16(Week 16)</b>	Quality Improvement
<b>Session 17(Week 17)</b>	Health care information Technology Health and Nursing Information Collection System
<b>Session 18(Week 18)</b>	Healthcare Financing, Cost and revenue management
<b>Session 19(Week 19-20)</b>	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)	<b>Final Exam</b>
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 Technique I

1	Course name	<b>Radiographic Techniques I</b>
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..
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>Eugene D. Frank, et all, (2007). Merrill's Atlas Of Radiographic Positioning &amp; Procedures, Eleventh Edition</li> <li>Textbook of Radiographic Positioning and Related Anatomy (Plus Bontrager Workbook) by Bontrager, Mosby Systems 10th edition</li> <li>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</li> <li>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).</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lectures Collaborative learning/Team work, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>	Up on completion of this course students will be able to: <ul style="list-style-type: none"> <li>Understand the concept of anatomy and positioning of x ray radiography.</li> <li>The practice of different positions.</li> <li>Identifying pathology in the x-ray image.</li> <li>Image interpretation in x-ray film.</li> <li>Radiological investigations</li> <li>knowing the protocols of x ray in radiology</li> </ul>
<b>Course Assessments</b>	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.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction Orientation to course and program Explanation of the syllabus and course requirements.
<b>Session 2 (Week 2)</b>	Standard Terminology Radiation safety practices and principles continued terminology associated with radiographic imaging body positions, projections and planes
<b>Session 3 (Week 3)</b>	Positioning Terms Positions, projections, planes and terms related to patient positioning Chest radiography alternate projections/methods
<b>Session 4 (Week 4)</b>	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)	<b>Midterm Exam</b>
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)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		The course is designed to enable the student to acquire sufficient knowledge to carry out image recording techniques currently employed in medical imaging.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>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.</li> <li>Preview Radiographic Imaging and Exposure 6th Edition – 2020 by Terri Fauber</li> <li>Principles of Radiographic Imaging: An Art and a Science by Arlene M. Adler and Richard R. Carlton 2012</li> <li>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).</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures, Collaborative learning/Team work Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>		Up on completion of this course students will be able to: <ul style="list-style-type: none"> <li>Identify the principles of photography.</li> <li>Demonstrate the ability to properly operate imaging equipment and photographic and radiographic aspects of medical imaging.</li> <li>Determine proper exposure factors to obtain diagnostic quality radiographs.</li> <li>Demonstrate proper positioning skills.</li> <li>Demonstrate knowledge of radiation protection principles.</li> <li>Demonstrate effective oral communication skills. PLEASE OMIT "and program effectiveness data"</li> <li>Demonstrate written communication skills.</li> <li>Provide quality patient care.</li> </ul>



	<ul style="list-style-type: none"> <li>• Apply critical thinking skills in the practice of diagnostic radiography.</li> <li>• Effectively analyze/critique radiographic images for diagnostic quality.</li> <li>• Demonstrate ethical integrity consistent with the ARRT Code of Ethics.</li> <li>• Demonstrate professional behavior and values</li> </ul>
<b>Course Assessments</b>	<p>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.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction
<b>Session 2 (Week 2)</b>	The Photographic & Radiographic Process
<b>Session 3 (Week 3)</b>	Image Characteristics
<b>Session 4 (Week 4)</b>	Photographic Principles
<b>Session 5 (Week 5)</b>	Recording System: Film Materials
<b>Session 6 (Week 6)</b>	Recording System: Film storage
<b>Session 7 (Week 7)</b>	Recording System: Film Cassettes
<b>Session 8(Week 8)</b>	Intensifying Screen speed and Image Quality
<b>Session 9 (Week 9)</b>	Radiographic Processing: Principles
<b>Session 10 (Week 10)</b>	Radiographic Processing: Practice
<b>Session 11 (Week 11)</b>	The Processing Area
<b>Session 12 (Week 12)</b>	Silver Recovery
<b>Session 13 (Week 13-14)</b>	Automated Film-Handling System
<b>Session 14 (Week 15)</b>	Presentation and viewing of Radiographs
<b>Session 15(Week 16)</b>	Storage and archiving of exposed films:
<b>Session 17 (Week 17)</b>	<b>Midterm Exam</b>
<b>Session 19(Week 18)</b>	Image Artifacts
<b>Session 21 (Week 19&amp;20)</b>	Image Quality Control
<b>Session 22 (Week 21)</b>	The Fluoroscopic Image
<b>Session 23 (Week 22)</b>	The Image Intensifier
<b>Session 24 (Week 23)</b>	Photofluorography of the intensified image
<b>Session 25 (Week 24&amp;25)</b>	Special Imaging Techniques
<b>Session 26 (Week 26)</b>	Other imaging technologies
<b>Session 27 (Week 27&amp;28)</b>	Computed Radiography
<b>Session 28 (Week 29)</b>	Revision and review
<b>Session 29 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.





<b>Course Change</b>	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.
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## Radiation physics

1	<b>Course name</b>	<b>Radiation physics</b>
2	<b>Course Code</b>	RD204
3	<b>Course type:</b> <b>/general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Physics
7	<b>Program offered the course</b>	Medical Radiology Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Radiologic Technology. American Society of Radiologic Technologists, Albuquerque, NM.</li> <li>• The Physics of Radiology, 4<sup>th</sup> Edition, by Johns and Cunningham</li> <li>• Radiation Physics for Medical Physicists (Biological and Medical Physics, Biomedical Engineering) by Ervin B. Podgorsak</li> <li>• <a href="http://www.naweb.iaea.org/nahu/dmrp/documents/slides/chapter_01_basics_radiation_physics.pdf">http://www.naweb.iaea.org/nahu/dmrp/documents/slides/chapter_01_basics_radiation_physics.pdf</a></li> <li>• A Textbook of Radiation Physics for Radiologic Technology March 2021 Publisher: Samikshya Publication by Suraj Sah and Suraj Sah</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures Collaborative learning/Team work Problem based learning Tutorials (office hours) Class discussion



	Practical Demonstrations
<b>Course Objectives:</b>	<p>Upon completion, successful students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the mechanisms describing radioactive decay and the production of ionizing radiation; the interactions of ionizing radiation with matter;</li> <li>• Describe the imaging and treatment equipment used for the clinical care of cancer patients;</li> <li>• Discuss the use of devices and protocols for the accurate measurement of ionizing radiation and calibration of clinical equipment;</li> <li>• Understand the role of the physicist in radiation medicine</li> <li>• Describe electromagnetic spectrum of radiation.</li> <li>• Describe the methods of emissions of secondary ionizing radiation</li> <li>• Describe radiation instrumentation and personnel monitoring devices.</li> <li>• Understand radioactivity and disintegrations</li> </ul>
<b>Course Assessments</b>	<p>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.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An Introduction to radiation physics Basics of X-ray Physics
<b>Session 2 (Week 2 &amp;3)</b>	Matter and the atom Atoms, Radiation, and Radioactivity a. Atomic Structure and Transitions b. Nuclear Structure
<b>Session 3 (Week 4 )</b>	Interactions of Radiation and Tissue a. Photon Interactions
<b>Session 4 (Week5- 6)</b>	Radiation Measurements and Units a. International System of Units b. The Concept of Dose c. ICRP Weighting factors d. Units e. Radiation Detectors
<b>Session 5 (Week 7-8)</b>	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
<b>Session 6 (Week 9)</b>	Common terms related to the x-ray beam
<b>Session 7 (Week10&amp;11)</b>	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)	<b>Midterm Exam</b>
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)	<b>Final Exam</b>
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
<b>Brief Description:</b>	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.	
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Bushong S. Radiologic Science for Technologists: Physics, Biology, and Protection. 8th ed. St. Louis, Mo: Mosby; 2001</li> <li>• An Introduction to Radiation Protection by Alan Martin, Sam Harbison, Karen Beach, Peter Cole 7<sup>th</sup> edition 2018</li> <li>• Physics for Radiation Protection: A Handbook, Second Edition by James E. Martin First published:6 June 2006</li> <li>• <a href="https://ehs.ucsc.edu/programs/researchsafety/radiation/documents/rsfw58.pdf">https://ehs.ucsc.edu/programs/researchsafety/radiation/documents/rsfw58.pdf</a></li> <li>• Principles of Radiation Protection: A Textbook of Health Physics by E. E. Stickley</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>	
<b>Course Duration</b>	4 * 28 = 112 teaching hours	
<b>Delivery</b>	Lectures, Collaborative learning/Team work. Problem based learning, Tutorials (office hours). Class discussion, Practical Demonstrations.	
<b>Course Objectives:</b>	 <p>Upon completing the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the importance of studying radiation protection.</li> <li>• Describe the concept of radiation hazards.</li> <li>• Use professional terminology appropriately.</li> <li>• Identify quantities and units related to radiation protection.</li> <li>• Describe means for radiation protection of staff.</li> <li>• Describe means for radiation protection to patients.</li> <li>• Specify safety concerns related to the use of x-ray equipment.</li> <li>• Describe the effects of radiation on the human body.</li> <li>• Identify genetic effects related to the study of radiation.</li> <li>• Understand the term radiation oncolog</li> </ul>	
<b>Course Assessments</b>	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.	
<b>Content Breakdown</b>	<b>Topics Coverage</b>	
<b>Session 1 (Week 1)</b>	Introduction to radiation protection	
<b>Session 2 (Week 2)</b>	Radiation units	
<b>Session3(Week3&amp;4&amp;5)</b>	Surveys, Regulatory and Agencies and Regulations	
<b>Session 4 (Week 6 &amp; 7)</b>	Safety in Production of X rays and making exposure.	
<b>Session 5 (Week 8 &amp; 9)</b>	Methods of radiation protection in diagnostic department	
<b>Session 6 (Week 10)</b>	Personnel Monitoring radiation dosimeters	
<b>Session 7 (Week 11)</b>	Primary barrier exposure factors	
<b>Session8(Week 12&amp; 13)</b>	Consideration Of Risk / Benefits Of Radiation Exposure.	



<b>Session 9 (Week14&amp;15)</b>	Application of protection Secondary barrier HVL and tenth-value layer (TVL) Anti scatter Grids
<b>Session 10 (Week 16)</b>	<b>Midterm Exam</b>
<b>Session11(Week17&amp;18)</b>	Patient Protection Beam-limiting devices Filtration
<b>Session 12(Week 19)</b>	kV , compression band
<b>Session 13(Week 20)</b>	Protection for pregnant and Pediatric
<b>Session 14(Week 21)</b>	Effect Of Radiation On Pregnancy
<b>Session15(Week 22&amp;23)</b>	A awareness of absorbed dose, dose equivalent and effective dose.
<b>Session16(Week24&amp; 25)</b>	Protection during fluoroscopy interventional radiology- CT
<b>Session17(Week26&amp; 27)</b>	Optimization of image quality and patient dose
<b>Session 18 (Week 28)</b>	Revision (Questions answering and discussion).
<b>Session 18 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	<p>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.</p>
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Tuckman, B. W. &amp; Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan &amp; Littlefield Publishers (ISBN: 978-1-4422-0964-0).</li> <li>• Cohen, L. Lawrence, M., &amp; Morrison, K. (2005). Research Methods in Education (5th edition). Oxford: Oxford University Press.</li> <li>• Denscombes, M. (2010). The Good Research Guide: For small-scale social research projects. Maiden-Read: Open University Press.</li> <li>• Dornyei, Z. (2007). Research Methods in Applied Linguistics. Oxford: Oxford University Press.</li> <li>• 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.</li> <li>• Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers.</li> <li>• Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3<sup>rd</sup> edition). London, UK: TJ International Ltd, Padstow, Cornwall</li> <li>• Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc.</li> <li>• Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited, Publishers.</li> <li>• Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications.</li> </ul>





	<ul style="list-style-type: none"> <li>• <a href="http://www.pitt.edu/~super7/43011-44001/43911.ppt">http://www.pitt.edu/~super7/43011-44001/43911.ppt</a></li> <li>• <a href="http://web.tamu-commerce.edu/academics/graduateSchool/">http://web.tamu-commerce.edu/academics/graduateSchool/</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Upon completing this course, each student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand some basic concepts of research and its methodologies and identify appropriate research topics.</li> <li>• Demonstrate knowledge of research processes (reading, evaluating, and developing).</li> <li>• Perform literature reviews using print and online databases.</li> <li>• Understand the formats for citations of print and electronic materials.</li> <li>• Identify, explain, compare, and prepare the key elements of a research proposal/report.</li> <li>• Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them.</li> <li>• Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research.</li> <li>• Describe sampling methods, measurement scales and instruments, and appropriate uses of each.</li> <li>• Explain the rationale for research ethics and importance</li> <li>• select and define appropriate research problem and parameters</li> <li>• prepare a project proposal (to undertake a project)</li> <li>• organize and conduct research (advanced project) in a more appropriate manner</li> <li>• Write a research report, thesis and research proposal.</li> <li>• Make Critical Appraisal of the Literature</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to research methodology <ul style="list-style-type: none"> <li>• Meaning of Research</li> <li>• Definitions of Research</li> <li>• Objectives of Research</li> </ul>
<b>Session 2 (Week 2)</b>	Introduction to research methodology <ul style="list-style-type: none"> <li>• Motivation in Research</li> <li>• General Characteristics of Research</li> <li>• Criteria of Good Research</li> </ul>
<b>Session 3 (Week 3)</b>	The Research Problem <ul style="list-style-type: none"> <li>• Scientific Thinking</li> <li>• What is a Research Problem?</li> <li>• Selecting the Problem</li> <li>• Sources of the Problem</li> <li>• Defining a Problem</li> <li>• Statement of a Problem</li> <li>• Delimiting a Problem</li> </ul>





	<ul style="list-style-type: none"> <li>Evaluation of a Problem</li> </ul> Assignment 1 handed out
Session 4 (Week 4)	<ul style="list-style-type: none"> <li>The Review of Literature               <ul style="list-style-type: none"> <li>Meaning of Review of Literature</li> <li>Need of Review of Literature</li> <li>Objectives of Review of Literature</li> <li>Sources of Literature</li> <li>The Functions of Literature</li> <li>How to Conduct the Review of Literature</li> <li>Some Hints for the Review of Literature</li> <li>Precautions in Library Use</li> <li>Reporting the Review of Literature</li> </ul> </li> </ul>
Session 5 (Week 5)	Practice on how to find a literature <ul style="list-style-type: none"> <li>Selecting a topic</li> <li>Highlighting the electronic websites that help to better search of literature</li> </ul>
Session 6 (Week 6)	The Research Hypotheses <ul style="list-style-type: none"> <li>Meaning of Hypothesis</li> <li>Definitions of Hypothesis</li> <li>Nature of Hypothesis</li> <li>Functions of Hypothesis</li> <li>Importance of Hypothesis</li> <li>Kinds of Hypothesis</li> <li>Characteristics of a Good Hypothesis</li> <li>Variables in a Hypothesis</li> <li>Formulating a Hypothesis</li> <li>Testing the Hypothesis</li> </ul> Assignment 2 handed out
Session 7 (Week 7)	The Research Approach <ul style="list-style-type: none"> <li>The Philosophical Background</li> <li>The Qualitative Approach</li> <li>The Quantitative Approach</li> <li>The Mixed-Methods Approach</li> </ul>
Session 8 (Week 8)	Criteria for Selecting a Research Approach
Session 9 (Week 9)	The Research Designs <ul style="list-style-type: none"> <li>Meaning of research design</li> <li>Need for research design</li> <li>features of a good design</li> </ul>
Session 10 (Week 10)	Review
Session 11 (Week 11)	Assignment of research paper <ul style="list-style-type: none"> <li>selecting paper</li> <li>guidelines of reading research paper</li> </ul>
Session 12 (Week 12)	Assignment of research paper <ul style="list-style-type: none"> <li>Review before submitting the assignment</li> </ul>
Session 13 (Week 13)	Cross-sectional study
Session 14 (Week 14)	Case-control study
Session 15 (Week 15)	Cohort study
Session 16 (Week 16)	<b>Midterm Exam</b>
Session 17 (Week 17)	Experimental study
Session 18 (Week 18)	Criteria for Selecting a Research design
Session 19 (Week 19)	Sampling





	<ul style="list-style-type: none"> <li>• Meaning and Definition of Sampling</li> <li>• Functions of Population and Sampling</li> <li>• Methods of Sampling</li> <li>• Characteristics of a Good Sample</li> <li>• Size of a Sample</li> </ul>
<b>Session 20 (Week 20)</b>	Data Collection Methods <ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Interviews</li> <li>• Focus Groups</li> <li>• Observation</li> </ul>
<b>Session 21 (Week 21)</b>	Interviewing techniques <ul style="list-style-type: none"> <li>• Face-to-face interview</li> <li>• Telephone interview</li> <li>• Computer based interview</li> </ul>
<b>Session 22 (Week 22)</b>	Data management and analysis <ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• inferential statistics</li> </ul>
<b>Session 23 (Week 23)</b>	Writing research proposal
<b>Session 24 (Week 24)</b>	Writing research report
<b>Session 25 (Week 25)</b>	Critical Appraisal of the Literature
<b>Session 26 (Week 26)</b>	Guidelines for submitting graduation project
<b>Session 27 (Week 27)</b>	Review of research methodology
<b>Session 28 (Week 28)</b>	Revision and discussion
<b>Session 29 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis of Disease 10th Edition - May 18, 2020</li> <li>• Robbins &amp; 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</li> <li>• Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744.</li> <li>• Textbook of pathology by Harsh Mohan 6<sup>th</sup> edition, ISBN: 978-81-8448-702-2, 2010.</li> <li>• <a href="https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf">https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf</a></li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation and Laboratory experiments.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the common terms and definitions used in pathology</li> <li>• Identify of the nature of the disease, including its causes, growth patterns, and consequences</li> <li>• Recognize the biological characteristics that distinguish each disease from the other.</li> <li>• The ability to distinguish the origin of the disease and how it develops</li> </ul>





	<p>The ability to distinguish the origin of the disease and how it develops</p> <ul style="list-style-type: none"> <li>• That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment</li> <li>• The student will infer the causes of disease and its growth patterns</li> <li>• The student determines the appropriate diagnostic tools and mechanisms to detect the disease</li> </ul>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam 20 %  Attendances 10%                  Final Exam 60%  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• <b>Introduction to pathology</b></li> <li>• Pathology gives explanations of a disease by studying the following four aspects of the disease <ol style="list-style-type: none"> <li>1. Aetiology</li> <li>2. Pathogenesis</li> <li>3. Morphologic changes</li> <li>4. Functional derangements and clinical significance</li> </ol> </li> <li>• The causes of disease <p>Environmental factors  Genetic Factors</p> </li> </ul>
<b>Session 2 (Week 2)</b>	<p><b>Cell injury.</b></p> <ul style="list-style-type: none"> <li>- Homeostasis &amp; Cellular adaptation.</li> <li>- Cellular injury and its etiology &amp; pathogenesis.</li> <li>- Hypoxic cell injury ( Reversible &amp; Irreversible cell injury ).</li> </ul>
<b>Session 3 (Week 3)</b>	<p><b>Cell injury.</b></p> <ul style="list-style-type: none"> <li>- Free radicals ( sources, effects &amp; destruction of FR ).</li> <li>- Cell injury by chemicals and Cell injury by viruses.</li> </ul>
<b>Session 4(Week 4)</b>	<p><b>Cell injury.</b></p> <ul style="list-style-type: none"> <li>- Cell Aging.</li> <li>- Necrosis, Apoptosis &amp; Gangrene.</li> <li>- Calcification, Pigmentation &amp; Intracellular Accumulations.</li> </ul>
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• <b>Inflammation .</b></li> <li>a. Acute inflammation &amp; its types.</li> </ul>
<b>Session 6 (Week 6)</b>	b. Chronic inflammation, Granuloma & its types.
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>• <b>Repair and healing.</b></li> </ul>
<b>Session 8 (Week 8)</b>	<ul style="list-style-type: none"> <li>• <b>Infectious diseases.</b></li> <li>a. Bacterial, Viral, Fungal and Parasitic infection - a general outline</li> <li>b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis &amp; Hydatid disease.</li> </ul>
<b>Session 9 (Week 9)</b>	<ul style="list-style-type: none"> <li>• <b>Immunopathology.</b></li> <li>1. Immune mechanism of tissue injury: <ol style="list-style-type: none"> <li>a. Type I hypersensitivity.</li> <li>b. Type II hypersensitivity.</li> <li>c. Type III hypersensitivity.</li> <li>d. Type IV hypersensitivity.</li> <li>e. Tissue transplantation.</li> </ol> </li> </ul>
<b>Session 10 (Week 10)</b>	<ul style="list-style-type: none"> <li>2. Autoimmune diseases: <ol style="list-style-type: none"> <li>a. Systemic Lupus Erythematosus.</li> <li>b. Rheumatoid arthritis.</li> </ol> </li> </ul>





	c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
<b>Session 11(Week 11)</b>	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS Amyloidosis
<b>Session 12(Week 12)</b>	• <b>Nutrition disorder.</b> Malnutrition, Obesity and Vitamin deficiency disorders.
<b>Session 13 (Week 13)</b>	• <b>Ionizing radiation.</b> a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
<b>Session 14(Week 14)</b>	• <b>Hemodynamic disorders</b> Edema, Hyperemia, Congestion, Hemorrhage
<b>Session 15Week 15)</b>	, embolism, thrombosis & Infarction & Shock.
<b>Session 16Week 16)</b>	<b>GENETIC DISORDERS</b> a. Single - Gene Defect "Mendelian Disorders" b. Disorders with Multifactorial Inheritance
<b>Session 17Week 17</b>	c. Cytogenic Disorders "Chromosomal Aberations"
<b>Session18(Week18)</b>	• <b>Neoplasia.</b> - Tumours, Aetiology & spread, common tumours.
<b>Session19(Week19 - 22)</b>	<b>Respiratory diseases.</b> Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
<b>Session20(Week23 - 27)</b>	<b>Cardiovascular diseases .</b> - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
<b>Session 21(Week28 )</b>	<b>Revision and discussion</b>
<b>Session 22(Week29 - 30 )</b>	<b>Final exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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
<b>Course Change</b>	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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>Eugene D. Frank, et all, (2007). Merrill's Atlas Of Radiographic Positioning &amp; Procedures, Eleventh Edition</li> <li>Radiographic photography &amp; technique ii with mcqs in radiograph by: niranjan thapa 1<sup>st</sup> edition.</li> <li>Intraoral radiographic technique ii by priyadershini rangari 2014</li> <li>Radiological Procedures - A Guideline, Textbook of Radiology for residents and technicians</li> <li>Workbook for Merrill's Atlas of Radiographic Positioning and Procedures by Jeannean Hall Rollins; Bruce W. Long; Tammy Curtis</li> <li>Bushong, Stewart C.: Radiologic Science for Technologists, 10th edition, ISBN: 978-0-323-08135-1, Elsevier, Mosby Publishing 2013.</li> <li>Carlton, Richard. Principles of Radiographic Imaging, An Art and Science, 5<sup>th</sup> edition, Delmar Publishing, ISBN# 10: 1-4390-5872-5 (Required in RADR 1313 taught in previously required course</li> <li>Notes from RADR 1313 Principles of radiographic Imaging</li> <li>Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures, Problem based learning, Tutorials, Class discussion and Practical Demonstrations
<b>Course Objectives:</b>		By the end of the semester of instruction the student will:





	<ul style="list-style-type: none"> <li>• Apply the basic principles of radiographic image acquisition to image quality</li> <li>• Analyze the effects of exposure variables upon image quality</li> <li>• Demonstrate knowledge of advanced modalities utilized in the diagnostic department, ie. mobile, fluoroscopy, and computed tomography</li> <li>• Develop a technique chart</li> <li>• Lab experiments will be done in RADR 2333 to reinforce the material discussed in this course</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to Vertebral column investigations
<b>Session 2 (Week 2)</b>	Atlas & axis
<b>Session 3 (Week 3 &amp; 4)</b>	Cervical Vertebrae
<b>Session 4 (Week 5 &amp; 6)</b>	Thoracic Vertebrae
<b>Session 5 (Week 7)</b>	Lumbar Vertebrae
<b>Session 6 (Week 8)</b>	Sacrum
<b>Session 7 (Week 9)</b>	Coccyx
<b>Session 8 (Week 10)</b>	Introduction to skull investigations
<b>Session 9 (Week 11, 12 &amp; 13)</b>	Cranium Investigations
<b>Session 10 (Week 14, 15 &amp; 16)</b>	Facial Bones Investigations
<b>Session 11 (Week 17)</b>	Midterm Exam
<b>Session 12 (Week 18 &amp; 19)</b>	Paranasal sinuses
<b>Session 13 (Week 20 &amp; 21)</b>	Orbital cavity Investigations
<b>Session 14 (Week 22)</b>	Nasal bones
<b>Session 15 (Week 23)</b>	Mastoid area
<b>Session 16 (Week 24)</b>	Mandible
<b>Session 17 (Week 25)</b>	Dental Radiography
<b>Session 18 (Week 26, 27 &amp; 28)</b>	Abdomen Investigation
<b>Session 18 (Week 29)</b>	Revision and discussion
<b>Session 20 (Week 30)</b>	Final Exam
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Clinical Anatomy by Systems by Richard S Snell 2006</li> <li>• Radiological Anatomy Prepared By Amr Attia Hewety 2018 <a href="https://jrms.jaf.mil.jo/Files/f4dca080-c9b3-4de6-9d3c-604b6ea2ca16.pdf">https://jrms.jaf.mil.jo/Files/f4dca080-c9b3-4de6-9d3c-604b6ea2ca16.pdf</a></li> <li>• 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</li> <li>• 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</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures, Collaborative learning/Team work Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>		Up on comlection of the course the participants should be able to: <ul style="list-style-type: none"> <li>• Understand various terminology used in anatomy and its sub-divisions.</li> <li>• Describe the anatomical implications of cancer spread.</li> <li>• Discuss 3D relationships of organs and their surrounding structures.</li> <li>• Identify tissues and organs at risk from either cancer spread or treatment delivery.</li> <li>• Demonstrate key concepts in radiological and cross sectional anatomy with reference to oncology.</li> </ul>
<b>Course Assessments</b>		Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam        60%





	A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
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)	<b>Midterm Exam</b>
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)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	The course is designed to introduce the student to the principles physics of the Computerized Tomography, Magnetic resonance Imaging and ultra sound devices.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• John Ball, Adrian D Moore, Essential Physics for Radiographers, Third Edition</li> <li>• <a href="https://rads.web.unc.edu/wpcontent/uploads/sites/12234/2018/05/Phy-MRI-Made-Easy.pdf">https://rads.web.unc.edu/wpcontent/uploads/sites/12234/2018/05/Phy-MRI-Made-Easy.pdf</a></li> <li>• 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</li> <li>• Diagnostic Radiology Physics A Handbook for Teachers and Students by D.R. Dance S. Christofides A.D.A. Maidment I.D. McLean K.H. Ng Technical Editors 2014</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teachin hours
<b>Delivery</b>	Lectures, Problem based learning, Tutorials, Class discussion and Practical Demonstrations
<b>Course Objectives:</b>	<p>Up on complecton of the course te studnets shoud be able to:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Apply fundamental mathematical and engineering principles (sampling, Fourier transform, linear systems) in the development of imaging systems and image acquisition.</li> <li>• Develop understanding of the interactions between electromagnetic, acoustic, or other forms of energy and biological tissues and apply these principles to imaging system design.</li> </ul>





	<ul style="list-style-type: none"> <li>• 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.</li> <li>• -Utilize understanding of imaging physics and imaging systems engineering principles in order to reconstruct acquired data into images.</li> <li>• 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</li> </ul>
<b>Course Assessments</b>	Quizzes 5 %    Mid-term exam 20 %    Activities 10 % Attendances 5 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Historical Background and nature of ultrasound
<b>Session 2 (Week 2)</b>	Acoustic Intensity and Power Acoustic Reflection
<b>Session 3 (Week 3 &amp; 4)</b>	Acoustic Absorption and Attenuation Image resolution
<b>Session 4 (Week 5)</b>	Wave theory and Equation.
<b>Session 5 (Week 6)</b>	Ultrasound instrumentation
<b>Session 6 (Week 7)</b>	Doppler Ultrasound
<b>Session 7 (Week 8 )</b>	Real-Time Imaging
<b>Session 8 (Week 9)</b>	Basic principles of diagnostic ultrasound images artifacts
<b>Session 9 (Week 10)</b>	Biological effects of ultrasound
<b>Session 10 (Week 11)</b>	Physical principle of Magnetism
<b>Session 11 (Week 12)</b>	Basic terminology related to MR imaging
<b>Session 12 (Week 13)</b>	NMR Signal Production
<b>Session 13 (Week 14)</b>	Tissue Characteristics
<b>Session 14 (Week 15)</b>	Pulse Sequencing
<b>Session 15 (Week 16)</b>	Brief overview of clinical applications of MRI
<b>Session 16 (Week 17)</b>	Brief overview of imaging parameters
<b>Session 17 (Week 18)</b>	<b>Midterm Exam</b>
<b>Session 18 (Week 19)</b>	Instrumentation
<b>Session 19 (Week 20)</b>	Imaging Parameters and image quality/Options
<b>Session 20 (Week 21)</b>	Patient preparation and monitoring
<b>Session 21 (Week 22)</b>	Basic patient and personnel safety
<b>Session 22 (Week 23)</b>	Historical Background and nature of CT
<b>Session 23 (Week 24)</b>	Physical principle of CT.
<b>Session 24 (Week 25)</b>	Describe CT generations
<b>Session 25 (Week 26)</b>	Describe factors controlling image appearance
<b>Session 26 (Week 27)</b>	Identifying CT artifacts
<b>Session 27 (Week 28)</b>	Revision (Question answering and discussion).
<b>Session 28 (Week 29-30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>Nuclear Medicine &amp; Radiotherapy Physics</b>
2	<b>Course Code</b>	RD304
3	<b>Course type: /general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	3 units
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Physics/Radiation Physics
7	<b>Program offered the course</b>	Medical Radiology Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
	<b>Brief Description:</b>	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.
	<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Faiz M. Khan, PhD, The Physics of Radiation Therapy, ISBN 978-1-4511-8245-3</li> <li>• Nuclear Medicine Physics Edited By Joao Jose De Lima 1<sup>st</sup> edition 2011</li> <li>• An Introduction to the Physics of Nuclear Medicine by Laura Harkness-Brennan 2018</li> <li>• Walter and Miller's Textbook of Radiotherapy: Radiation Physics, Therapy and Oncology 8<sup>th</sup> edition.</li> <li>• Handbook of Radiotherapy Physics Theory and Practice, Second Edition, 2021</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
	<b>Course Duration</b>	4 * 28 = 112 teaching hours
	<b>Delivery</b>	Lectures, Problem based learning, Tutorials





	Class discussion, Practical Demonstrations
<b>Course Objectives:</b>	<p>On completion of the course, the student should be able to;</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Describe the technical structure and physical the background of the Gamma camera and the PET camera,</li> <li>• Describe the production and absorption mechanism of the radiopharmaceuticals.</li> <li>• Apply radiation protection regulations in connection with nuclear medical examinations.</li> <li>• Calculate the dose, complete and inject radiopharmaceuticals.</li> <li>• 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.</li> <li>• Analyse a nuclear medical study in order to obtain a diagnostic understanding thereby.</li> <li>• Be familiar with structure and use of PET-CT.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to the physics of radiotherapy and nuclear medicine
<b>Session 2 (Week 2)</b>	Instrumentation
<b>Session 3 (Week 3 &amp; 4)</b>	Emission computed tomography
<b>Session 4 (Week 5)</b>	Single Photon Emission Computed Tomography SPECT
<b>Session 5 (Week 6)</b>	Positron Emission Tomography
<b>Session 6 (Week 7)</b>	Radiochemistry and Radio pharmacy
<b>Session 7 (Week 8 )</b>	Gallium and indium radiopharmaceuticals
<b>Session 8 (Week 9)</b>	Thallium chloride
<b>Session 9 (Week 10)</b>	Iodinated radiopharmaceuticals
<b>Session 10 (Week 11)</b>	PET radiopharmaceuticals
<b>Session 11 (Week 12)</b>	Therapeutic radiopharmaceuticals
<b>Session 12 (Week 13)</b>	General radiation safety practices and training
<b>Session 13 (Week 14)</b>	Contamination control
<b>Session 14 (Week 15)</b>	Spills and accidents.
<b>Session 15 (Week 16)</b>	Radioactive waste disposal
<b>Session 16 (Week 17)</b>	<b>Midterm Exam</b>
<b>Session 19 (Week 18)</b>	Types of radiation therapy devices
<b>Session 20 (Week 19)</b>	Types of radioactive sources used in radiation therapy
<b>Session 21 (Week 20)</b>	Types of radiation dosimeters
<b>Session 21 (Week 21)</b>	Methods for measuring and compiling radiation dose data
<b>Session 22 (Week 22)</b>	Methods for calculating radiation doses for radiotherapy.
<b>Session 23 (Week 23)</b>	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)	<b>Final Exam</b>
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:		<ul style="list-style-type: none"> <li>The Biology of Cancer Second Edition by Robert A Weinberg 2013</li> </ul>



	<ul style="list-style-type: none"> <li>• Oxford Textbook of Oncology (3<sup>rd</sup> edition) Arrow David J. Kerr (ed.), Daniel G. Haller (ed.), Cornelis J. H. van de Velde Michael Baumann 2016</li> <li>• Oxford Textbook of Cancer Biology by Francesco Pezzella, Mahvash Tavassoli, David Kerr 2019</li> <li>• <a href="https://www.desouzainstitute.com/wpcontent/uploads/Course_Syllabus-FONP-Jan-2016-v01_0.pdf">https://www.desouzainstitute.com/wpcontent/uploads/Course_Syllabus-FONP-Jan-2016-v01_0.pdf</a></li> <li>• <a href="file:///C:/Users/BMI/Downloads/medical_oncology_otr_e.pdf">file:///C:/Users/BMI/Downloads/medical_oncology_otr_e.pdf</a></li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lectures, Collaborative learning/Team work Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>	Upon completion of this course, the student will have reliably demonstrated the ability to: <ul style="list-style-type: none"> <li>• Understand the various terms used in the field of oncology.</li> <li>• Introducing the general principles of tumor diagnosis using modern radiological techniques.</li> <li>• Introducing the biological characteristics of tumors on which diagnostic and radiotherapy strategies are based</li> <li>• Introducing the general principles of treating tumors using modern radiological techniques</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to tumors and Definitions
<b>Session 2 (Week 2)</b>	Epidemiology of cancer
<b>Session 3 (Week 3)</b>	Carcinogenesis and etiology of cancer
<b>Session 4 (Week 4)</b>	Diagnosis of cancer and classification of tumors
<b>Session 5 (Week 5)</b>	Staging of cancer
<b>Session 6 (Week 6)</b>	Cancer problems
<b>Session 7 (Week 7)</b>	Spread of cancer
<b>Session 8 (Week 8)</b>	Doubling time, cell cycle
<b>Session 9 (Week 9)</b>	DNA synthesis and replication
<b>Session 10 (Week 10)</b>	DNA damage and repair
<b>Session 11 (Week 11)</b>	Hallmarks of cancer cells
<b>Session 12 (Week 12)</b>	Principles of chemotherapy
<b>Session 13 (Week 13)</b>	Cell cycle and mechanism of action of chemotherapeutics
<b>Session 14 (Week 14)</b>	Inducing angiogenesis & activating invasion & metastasis.
<b>Session 15 (Week 15)</b>	Drug resistance
<b>Session 17 (Week 16)</b>	<b>Midterm Exam</b>
<b>Session 18 (Week 17)</b>	Pharmacological factors
<b>Session 19 (Week 18)</b>	Classifications of chemotherapy agents
<b>Session 20 (Week 19)</b>	Hormones in treatment and causation of cancer
<b>Session 21 (Week 20-28)</b>	Clinical- epidemiological study of: Breast cancer , Lymphoma , Lung, Larynx , Ovary , Body uterus and CX. <ul style="list-style-type: none"> <li>• Bone cancer</li> <li>• Brain cancer</li> </ul>





	<ul style="list-style-type: none"> <li>• G. I tumors</li> <li>• Uterine cancer</li> <li>• Cervical cancer</li> </ul>
<b>Session 22 (Week 29)</b>	Revision and discussion
<b>Session 23 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>Radiation Biology</b>
2	<b>Course Code</b>	RD306
3	<b>Course type:</b> <b>/general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	2
5	<b>Educational hours</b>	2 hours per week
6	<b>Pre-requisite requirements</b>	Biology/Radiation physics/Radiation protection
7	<b>Program offered the course</b>	Medical Radiology Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Bushong S. Radiologic Science for Technologists: Physics, Biology, and Protection. 8th ed. St. Louis, Mo: Mosby; 2001</li> <li>• Radiation Biology: A Handbook for Teachers and Students 2010</li> <li>• Basic Radiation Biology Carl F. von Essen 1968, <a href="https://doi.org/10.1148/91.3.592">https://doi.org/10.1148/91.3.592</a></li> </ul>





	<ul style="list-style-type: none"> <li>• Radiation Biology for Medical Physicists By C. S. Sureka, Christina Armpilia 1<sup>st</sup> edition 2017</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lectures, Problem based learning, Tutorials, Class discussion and Practical Demonstrations
<b>Course Objectives:</b>	<p>Upon successful completion of this course, the student should be able to:</p> <ul style="list-style-type: none"> <li>• Understand types of ionizing radiation</li> <li>• Identify the molecular effects of radiation</li> <li>• Identify the types of radiation effects.</li> <li>• Correlate the radiation sensitivity and response</li> <li>• Describe the structures and functions of the human cell.</li> <li>• Differentiate between somatic and germ cells.</li> <li>• Describe the process of cell division for both somatic and germ cells.</li> <li>• Describe the principles of target theory.</li> <li>• Distinguish between direct and indirect effect of radiation on cells.</li> <li>• Describe the physical factors that affect radiation response.</li> <li>• Describe the biological factors affect radiation response.</li> <li>• Evaluate the radiosensitivity of tissue and organs.</li> <li>• Describe the purpose and construction of dose-response relationship curves.</li> <li>• Identify the different types of dose-response relationship curves.</li> <li>• Describe the stages of acute radiation syndrome and the radiation dose ranges associated with each specific syndrome.</li> <li>• Describe local tissue effects following exposure to high doses of radiation and the dose ranges associated with each specific effect.</li> <li>• Explain the long-term effects associated with excessive radiation exposure.</li> <li>• Discuss the correlation between radiation exposure and malignancy.</li> <li>• Discuss embryo and fetal effects of radiation exposure</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activities 10%    Attendances 10%. Final Exam 60 %.    A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Review of cell Biology
<b>Session 2 (Week 2)</b>	Types of ionizing radiation
<b>Session 3 (Week 3 &amp; 4)</b>	Molecular effects of radiation
<b>Session 4 (Week 5)</b>	The deposition of radiant energy
<b>Session 5 (Week 6 &amp; 7 )</b>	Cellular & Sub-cellular radiation effects
<b>Session 6 (Week 8 &amp; 9)</b>	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)	<b>Midterm exam</b>
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)	<b>Final Exam</b>
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	<b>Radiation &amp; Pharmacology</b>
2	Course Code	<b>RD307</b>
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.



<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Lippincott Illustrated Reviews: Pharmacology / Edition 7 by Karen Whalen PharmD, BCPS 2018</li> <li>• Pharmacology and Drug Administration for Imaging Technologists 2nd Edition - October 6, 2005</li> <li>• A Textbook of Clinical Pharmacology and Therapeutics 5<sup>th</sup> edition 2008</li> <li>• Chemistry and Pharmacology of Anticancer Drugs</li> <li>• By David E. Thurston, Ilona Pysz 2<sup>nd</sup> edition 2021</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion. self-directed activities.
<b>Course Objectives:</b> 	Upon completion of this course, the student will have reliably demonstrated the ability to: <ul style="list-style-type: none"> <li>• Acquire new knowledge in pharmacology by conducting and promoting innovative research.</li> <li>• Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs.</li> <li>• Report the clinical applications, side effects of drugs used in medicine.</li> <li>• Translate pharmacological principles into clinical decision making.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<b>A.General pharmacology:</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Drug sources.</li> <li>• Routes of drug administration.</li> <li>• Pharmacokinetics.</li> </ul>
<b>Session 2 (Week 2)</b>	<b>A.General pharmacology:</b> <ul style="list-style-type: none"> <li>• Pharmacodynamics.</li> <li>• Drug adverse effects and toxicity.</li> <li>• Drug-drug interactions.</li> </ul>
<b>Session 3 (Week3)</b>	<b>B.Autonomic nervous system:</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Sympathomimetics.</li> <li>• Sympathetic depressants.</li> </ul>
<b>Session 4 (Week4)</b>	<b>B.Autonomic nervous system:</b> <ul style="list-style-type: none"> <li>• Parasympathomimetics.</li> <li>• Parasympathetics depressants.</li> </ul>
<b>Session 5 (Week5)</b>	<b>B.Autonomic nervous system:</b> <ul style="list-style-type: none"> <li>• Drug acting on autonomic ganglia.</li> <li>• Skeletal muscle relaxants.</li> <li>• Drug acting on the eye.</li> </ul>



Session 6 (Week 6)	<b>C. Autacoids:</b> <ul style="list-style-type: none"> <li>• Histamine &amp; serotonin.</li> <li>• Prostaglandins &amp; eicosanoids.</li> <li>• Vasoactive peptides.</li> </ul>
Session7 (Week 7)	<b>D. Central nervous system:</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Sedative &amp; hypnotics.</li> </ul>
Session8 (Week 8)	<b>D. Central nervous system:</b> <ul style="list-style-type: none"> <li>• Analgesics and antipyretics &amp; NSAID.</li> <li>• Narcotic analgesics.</li> <li>• Anticonvulsants &amp; antiepileptics</li> </ul>
Session9 (Week 9)	<b>D. Central nervous system:</b> <ul style="list-style-type: none"> <li>• Antiparkinsonian drugs.</li> <li>• Antipsychotics and antianxiety &amp; antidepressants.</li> <li>• Local &amp; general Anaesthetic.</li> </ul>
Session 10 (Week 10)	<b>E. Cardiovascular system:</b> <ul style="list-style-type: none"> <li>• Antihypertensive &amp; antishock drugs.</li> <li>• Cardiac glycosides and congestive heart failure.</li> <li>• Antiarrhythmic drugs.</li> <li>• Drugs used in angina pectoris.</li> </ul>
Session 11(Week 11)	<b>. F. Blood:</b> <ol style="list-style-type: none"> <li>1. Coagulants, anticoagulants, fibrinolytics &amp; antiplatelets.</li> <li>2. Drugs used in treatment of anemia.</li> <li>3. Drugs used in treatment of hyperlipidemia.</li> </ol>
Session 12 (Week 12)	<b>G. Chemotherapy:</b> <ul style="list-style-type: none"> <li>• Sulphonamides &amp; quinolones.</li> <li>• B-lactum antibiotics (penicilins, cephalosporins).</li> </ul>
Session 13 (Week 13)	<b>G. Chemotherapy:</b> <ul style="list-style-type: none"> <li>• Chloramphenicol &amp; tetracyclines.</li> <li>• Aminoglycosides antibiotics.</li> <li>• Antifungal drugs</li> </ul>
Session 14 (Week 14)	<b>G. Chemotherapy:</b> <ul style="list-style-type: none"> <li>• Antiviral drugs.</li> <li>• Antituberculus.</li> <li>• Antimalarial drugs &amp; antiprotozoal.</li> </ul>
Session15 (Week 15)	<b>Midterm exam</b>
Session16 (Week 16)	<b>H. Endocrine drugs:</b> <ul style="list-style-type: none"> <li>• Antidiabetics drugs.</li> <li>• Antithyroid drugs.</li> </ul>
Session 17 (Week 17)	<b>H. Endocrine drugs:</b> <ul style="list-style-type: none"> <li>• Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).</li> </ul>
Session 18 (Week 18)	<b>H. Endocrine drugs:</b> <ul style="list-style-type: none"> <li>• Corticosteroids.</li> <li>• Sex hormones, contraceptives drugs.</li> </ul>
Session 19 (Week 19)	<b>I. Respiratory system:</b> <ul style="list-style-type: none"> <li>• Drugs used in treatment of bronchial asthma.</li> </ul>





Session 20(Week 20)	<b>I. Respiratory system:</b> <ul style="list-style-type: none"> <li>• Cough therapy.</li> <li>• Gas therapy</li> </ul>
Session 21 (Week 21)	<b>J. GIT:</b> <ul style="list-style-type: none"> <li>• Drugs used in treatment of peptic ulcer</li> <li>• Antiemetic drugs.</li> <li>• Drugs used in treatment of constipation and diarrhea.</li> <li>• Antispasmodics.</li> </ul>
Session 22 (Week 22)	<b>K. Urinary tract:</b> 1. Diuretics.      2. Urinary tract infection.
Session 23 (Week 23)	<b>Medicines used in preparing the patient in the radiology department, for example:</b> <ul style="list-style-type: none"> <li>*Laxatives</li> <li>*painkillers</li> <li>* local anesthetics</li> <li>* Sedative medications</li> </ul>
Session 24 (Week 24)	<b>Medicines for diagnostic radiology departments</b> <ul style="list-style-type: none"> <li>* Contrast fluids and materials used for radiological diagnosis of the patient.</li> <li>*Definition of negative contrast materials, positive contrast materials.</li> </ul>
Session 25 (Week 25)	Definition of iodine, organic iodine compounds, oils saturated with iodine. <ul style="list-style-type: none"> <li>* Organic iodine compounds used in radiographic imaging of the urinary tract and blood vessels.</li> <li>* Organic iodine compounds used in radiography of the gallbladder, either orally or intravenously.</li> <li>* Other organic iodine compounds.</li> </ul>
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
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	Knowledge of basic clinical skills required to meet the skills objective including interviewing, physical diagnosis, communication and clinical reasoning processes.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002.</li> <li>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)</li> <li>Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		6 * 28 = 168 teaching hours
<b>Delivery</b>		Collaborative learning/Team work, Problem based learning Class discussion, Practical Demonstrations
<b>Course Objectives:</b>		Up on completion of the course students should be able to: <ul style="list-style-type: none"> <li>Apply the practical skills through clinical training in the hospital.</li> <li>Develop radiographic technology skills for RAD 301, RAD 201.</li> <li>Apply patient care skills and methods of protection from the dangers of radiation.</li> <li>Apply X-ray image quality assessment.</li> <li>Begin applying the acquired knowledge and skills clinically.</li> </ul>
<b>Course Assessments</b>		Clinical Practice Assessment 70 % Clinical Practice Record Book 20 % Activity 5 % Attendance 5 %
<b>Content Breakdown</b>		<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>		Diagnostic Radiography positioning
<b>Session 2 (Week 2)</b>		Radiographic anatomy
<b>Session 3 (Week 3)</b>		Image evaluation
<b>Session 4 (Week 4)</b>		Radiation hazards and protection
<b>Session 5 (Week 5)</b>		Upper extremity: Fingers Investigations
<b>Session 6 (Week 6)</b>		• 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)	<b>Midterm Exam</b>
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)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002.</li> <li>• A Textbook of Radiographic Technique By: Mr. Niranjana Thapa, Mukunda Prasad Humagain 1st edition, 2019</li> <li>• 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)</li> <li>• Textbook of Gastrointestinal Radiology 3rd Edition - October 24, 2007</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>		Up on completion of this course student will be able to: <ul style="list-style-type: none"> <li>• Demonstrate accuracy in radiation protection for the patient, personnel, and self.</li> <li>• Exhibit knowledge, understanding, and dexterity in the proper use of radiographic equipment.</li> <li>• Adhere to the program's standards of attendance, punctuality, and dependability.</li> <li>• Conduct self in a professional manner with co-workers, the public, and other hospital staff.</li> </ul>





	<ul style="list-style-type: none"> <li>• Apply theory to practice by exhibiting ongoing, satisfactory job performance skills.</li> <li>• Select proper technical factors for radiographic procedures on an average patient.</li> <li>• Exhibit proper positioning skills as outlined by department protocol.</li> <li>• Demonstrate knowledge and understanding of various nursing procedures and basic patient care.</li> <li>• Develop and deliver an oral presentation as outlined in the Clinical Education Manual.</li> <li>• Demonstrate competence on radiographic procedures of the cervical, thoracic and lumbar spines, sacrum and coccyx, and skull as outlined in the Clinical Education Manual.</li> <li>• Critique images of the cervical, thoracic and lumbar spines, sacrum and coccyx, and skull for radiographic quality</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activities 10%    Attendances 10%. Final Exam 60 %.    A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1 &amp; 2)</b>	Introduction To Contrast Media
<b>Session 2 (Week 3 &amp; 4)</b>	Types of To Contrast Media
<b>Session 3 (Wee 5 &amp;6&amp; 7)</b>	Barium Investigations ( Gastrointestinal tract )
<b>Session 4 (Week 8)</b>	Cholecystography
<b>Session 5 (Week 9)</b>	Intra Venous Urographg ( Urinary System )
<b>Session 6 (Week 10 &amp; 11)</b>	Respiratory system
<b>Session 7 (Week 12 &amp; 13)</b>	Bronchography
<b>Session 8 (Week 14)</b>	Mammography
<b>Session 9 (Week 15)</b>	Female genital tract
<b>Session 10 (Week 16 )</b>	<b>Midterm exam</b>
<b>Session 11(Week 17 &amp; 18)</b>	Angiography
<b>Session12(Week 19 &amp; 20 )</b>	Arthrography
<b>Session 13 (Week 21&amp; 22)</b>	Myelography
<b>Session 14 (Week 23&amp;24)</b>	Catheter Angiography
<b>Session 15 (Week 25)</b>	Stereotactic Breast Biopsy
<b>Session 16 (Week 26&amp;27)</b>	Needle Biopsy of Lung (Chest) Nodules Trans jugular Intrahepatic Porto systemic Shunt (TIPS) Endovenous Ablation of Varicose Veins
<b>Session 17 (Week 28)</b>	Thrombolysis and Uterine Fibroid Embolization
<b>Session 18 (Week 29)</b>	Revision (equations answering and discussion).
<b>Session 19 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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).





	<ul style="list-style-type: none"> <li>Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based Group interaction and discussion. self-directed activities. active participation and Laboratory experiments.
<b>Course Objectives:</b>	<p>Up on completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>Extend X-Ray Image Interpretation abilities through a methodological approach to image analysis in an emergency or trauma setting.</li> <li>Recognise and identify the imaging appearances of the normal axial and appendicular skeleton, chest and abdominal structures and their normal variations;</li> <li>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;</li> <li>Critically evaluate and analyse images with regard to technical quality and anatomical detail and develop strategies for improvement when necessary;</li> <li>Demonstrate an understanding of the use of medical imaging in patient management and its appropriate use;</li> <li>Recognise and describe the diagnostic limitations of various imaging modalities;</li> <li>Apply the basic principles involved in systematic interpretation of radiographic images;</li> <li>Describe and practice the principles of radiographer reporting systems and express informed opinion by utilising rational and rigorous argument;</li> <li>Demonstrate critical and independent thinking which reflects current theory and practice.</li> <li>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</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li><b>Introduction to pathology</b> <ul style="list-style-type: none"> <li>Aetiology</li> <li>Pathogenesis</li> <li>Morphologic changes</li> <li>Functional derangements and clinical significance</li> </ul> </li> </ul>
<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li><b>The relationship of radiation with diseases.</b> Definition of x-rays. types of rays</li> </ul>
<b>Session 3 (Week 3)</b>	<ul style="list-style-type: none"> <li><b>The relationship of radiation with diseases.</b> 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</li> </ul>





Session 4 (Week 4)	<ul style="list-style-type: none"> <li>• General pathological events that are cleansed by x-rays.</li> </ul>
Session 5 (Week 5)	<ul style="list-style-type: none"> <li>• Orthopedic diseases: - Fractures, their types and their purification by x-rays, complications of fractures.</li> </ul>
Session 6(Week 6)	<ul style="list-style-type: none"> <li>• <b>Orthopedic diseases: -</b> Complete fracture, bone infection, bone tumors. Joint diseases.</li> </ul>
Session 7 (Week 7)	<ul style="list-style-type: none"> <li>• <b>Respiratory diseases: -</b> Upper respiratory diseases. Lower respiratory diseases.</li> </ul>
Session 8 (Week 8)	<ul style="list-style-type: none"> <li>• Respiratory diseases: - Bronchitis and Pneumonitis and bronchitis.</li> </ul>
Session 9 (Week 9)	<ul style="list-style-type: none"> <li>• <b>Respiratory diseases: -</b> Bronchiectomy. Lung cancer and tumors.</li> </ul>
Session10(Week10)	<ul style="list-style-type: none"> <li>• <b>Gastrointestinal diseases: -</b> Salivary gland and Esophagus.</li> </ul>
Session11(Week11)	<ul style="list-style-type: none"> <li>• <b>Gastrointestinal diseases: -</b> Stomach and duodenum. Liver and pancreas.</li> </ul>
Session12(Week12)	<ul style="list-style-type: none"> <li>• <b>Gastrointestinal diseases: -</b> Small and large intestine. Acute abdominal conditions.</li> </ul>
Session12(Week12)	<ul style="list-style-type: none"> <li>• <b>Liver and bile duct diseases- :</b> Gallstones, tumors. Hypertrophy and its types, obstruction of the bile ducts, jaundice.</li> </ul>
Session13(Week13)	<b>Midterm Exam</b>
Session14(Week14)	<ul style="list-style-type: none"> <li>• <b>Cardiovascular diseases:-</b> Rheumatism and its effect on the heart valves and Coronary thrombosis.</li> </ul>
Session15(Week15)	<ul style="list-style-type: none"> <li>• <b>Cardiovascular diseases:-</b> High blood pressure and Congestive heart.</li> </ul>
Session16(Week16)	<b>Midterm practical exam</b>
Session17(Week17)	<ul style="list-style-type: none"> <li>• <b>Cardiovascular diseases:-</b> Varicose veins and Vein thrombosis.</li> </ul>
Session18(Week18)	<ul style="list-style-type: none"> <li>• <b>Urinary system diseases: -</b> Congenital anomalies and Chronic acute nephritis.</li> </ul>
Session19(Week19)	<ul style="list-style-type: none"> <li>• <b>Urinary system diseases: -</b> Urinary tract stones and Urinary bladder diseases.</li> </ul>
Session20(Week20)	<ul style="list-style-type: none"> <li>• <b>Diseases of the female and male reproductive system- :</b> Congenital anomalies and Tumors.</li> </ul>
Session21(Week21)	<ul style="list-style-type: none"> <li>• <b>Diseases of the female and male reproductive system- :</b> Infections. Infertility and its cause.</li> </ul>
Session22(Week22)	<ul style="list-style-type: none"> <li>• <b>Endocrine diseases.</b></li> </ul>
Session23(Week23)	<ul style="list-style-type: none"> <li>• <b>Endocrine diseases.</b></li> </ul>
Session24(Week24)	<ul style="list-style-type: none"> <li>• <b>Nervous system diseases: -</b> Brain diseases, Brain tumors.</li> </ul>
Session24(Week25)	<ul style="list-style-type: none"> <li>• <b>Nervous system diseases: -</b> Spinal cord diseases, Spinal cord tumors.</li> </ul>





Session2 (Week 26)	<ul style="list-style-type: none"> <li>• <b>Nervous system diseases:</b> - Slipped disc. And congenital anomalies.</li> </ul>
Session27(Week27)	<ul style="list-style-type: none"> <li>• <b>Nervous system diseases:</b> - Radiological diseases of the brain and spinal cord.</li> </ul>
Session28(Week28)	<ul style="list-style-type: none"> <li>• <b>Revision and discussion</b></li> </ul>
Session28(Week29-30)	<b>Final exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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
<b>Course Change</b>	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	<b>CT, MRI &amp; US Techniques</b>
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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002.</li> <li>• Textbook of Radiology for CT and MRI Technicians with MCQs Kindle Edition by Sachin Khanduri 2017</li> <li>• Textbook of Radiology for CT and MRI Technicians with MCQs Sachin Khanduri 1<sup>st</sup> edition 2018</li> </ul>



	<ul style="list-style-type: none"> <li>• <a href="https://pubs.rsna.org/doi/abs/10.1148/radiology.175.3.814?journalCode=radiology">https://pubs.rsna.org/doi/abs/10.1148/radiology.175.3.814?journalCode=radiology</a></li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives</b>	<p>Up on completion of this course the student should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the basic principles and concepts of CT, MRI and ultrasound. incorporate scanning techniques learned to best demonstrate anatomy and disease.</li> <li>• Recognize CT, MRI and ultrasound artifacts and describe techniques to minimize their occurrence.</li> <li>• Compare the advantages and disadvantages of all of these diagnostic tools.</li> <li>• Demonstrate general characteristic features of CT, MRI and US techniques</li> <li>• Knowledge of portable and mobile equipment used in radio imaging techniques.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Principles of scanning Techniques Limitation of ultrasound as a technique and Use of equipment
<b>Session 2 (Week 2 )</b>	Obstetrics gynecology and Newborn
<b>Session 3 (Week 3,4,5 )</b>	Urinary system, Blood vessels and The abdomen
<b>Session 6 (Week 6)</b>	Cardiology and Echo cardiology colour Doppler
<b>Session 7 (Week 7, 8)</b>	Head and Ophthalmology
<b>Session 9 ( Week 9 &amp; 10 )</b>	Thyroid, breasts, and testes
<b>Session 10 (Week 11)</b>	Biopsy sampling techniques
<b>Session 11 (Week 12)</b>	Cross-infection
<b>Session 12 (Week 13)</b>	Difficulties of examination in case of post-operative patients
<b>Session 14 (Week 14)</b>	Introduction to C T Scan
<b>Session 15 (Week 15)</b>	Describe factors controlling image appearance and Identifying CT artifacts
<b>Session 17 (Week 16 )</b>	<b>Medterm Exam</b>
<b>Session 17 (Week 17 )</b>	C T Contrast Media
<b>Session16(Week18,19,20&amp;21)</b>	CT Applications
<b>Session 17 (Week 22)</b>	CT Angiography
<b>Session 17 (Week 23)</b>	Introduction to MRI, Basic terminology related to MRImaging And Tissue Characteristics
<b>Session 17 (Week 24)</b>	Brief overview of imaging parameters, Instrumentation and Imaging Parameters and image quality/Options
<b>Session 17 (Week 25)</b>	Patient preparation and monitoring Basic patient and personnel safety
<b>Session 17 (Week 26)</b>	MRI Contrast Media
<b>Session17(Week27,28,29&amp;30)</b>	Clinical applications of MRI
<b>Session 17 (Week 31)</b>	MRI Angiography
<b>Session 20 (Week 32)</b>	<b>Final Exam</b>





<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>Nuclear Medicine Techniques</b>
2	<b>Course Code</b>	RD404
3	<b>Course type: /general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	3 units
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Radiation protection
7	<b>Program offered the course</b>	Medical Radiology Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Nuclear Medicine Technology: Procedures and Quick Reference, Second Edition, Pete Shackett</li> <li>• Nuclear Medicine and PET/CT: Technology and Techniques 8th Edition by David Gilmore, Kristen Waterstram-Rich MS CNMT NCT FSNMTS 2016</li> <li>• Nuclear Medicine Textbook: Methodology and Clinical Applications 1st ed. 2019 Edition by Duccio Volterrani (Editor), Paola Anna Erba (Editor), Ignasi Carrió (Editor), H. William Strauss (Editor), &amp; 1 more</li> </ul>





	<ul style="list-style-type: none"> <li>Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>	<p>On completion of the course, the student should be able to;</p> <ul style="list-style-type: none"> <li>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.</li> <li>Describe the technical structure and physical the background of the Gamma camera and the PET camera,</li> <li>Describe the production and absorption mechanism of the radiopharmaceuticals.</li> <li>Apply radiation protection regulations in connection with nuclear medical examinations.</li> <li>Calculate the dose, complete and inject radiopharmaceuticals.</li> <li>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.</li> <li>Analyse a nuclear medical study in order to obtain a diagnostic understanding thereby.</li> <li>Be familiar with structure and use of PET-CT.</li> <li>Working in all fields of radiology</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction to Nuclear Medicine 1
<b>Session 2 (Week 2)</b>	Introduction to Nuclear Medicine 2
<b>Session 3 (Week 3)</b>	Patient care in nuclear medicine 1
<b>Session 4 (Week 4)</b>	Patient care in nuclear medicine 2
<b>Session 5 (Week 5)</b>	Nuclear Medicine Protocols
<b>Session 6 (Week 6)</b>	Review 1
<b>Session 7 (Week 7)</b>	Thyroid scan and uptake
<b>Session 8 (Week 8)</b>	Radioactive iodine therapy 1
<b>Session 9 (Week 9)</b>	Radioactive iodine therapy 2
<b>Session 10 (Week 10)</b>	Parathyroid Scintigraphy
<b>Session 11 (Week 11)</b>	Bone scan
<b>Session 12 (Week 12)</b>	Lungs V/Q scan 1
<b>Session 13 (Week 13)</b>	Lungs V/Q scan 2
<b>Session 14 (Week 14)</b>	Renal scintigraphy 1
<b>Session 15 (Week 15)</b>	Renal scintigraphy 2
<b>Session 16 (Week 16)</b>	Liver and spleen Imaging
<b>Session 17 (Week 17)</b>	<b>Midterm exam</b>





<b>Session 18 (Week 18)</b>	Cholescintigraphy
<b>Session 19 (Week 19)</b>	Nuclear Cardiology 1
<b>Session 20 (Week 20)</b>	Nuclear Cardiology 2
<b>Session 21 (Week 21)</b>	GIT imaging 1 and GIT imaging 2
<b>Session 23 (Week 22)</b>	Review 2
<b>Session 24 (Week 23)</b>	Lymphoscintigraphy
<b>Session 25 (Week 24)</b>	Infection and inflammation
<b>Session 26 (Week 25)</b>	Central Nervous System imaging 1
<b>Session 27 (Week 26)</b>	Central Nervous System imaging 1
<b>Session 28 (Week 27)</b>	Oncology SPECT and Oncology PET
<b>Session30(Week28)</b>	Bone Palliation and radiosynovectomy
<b>Session30(Week29)</b>	Revision (questions answering and discussion).
<b>Session 31 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Murat Beyzadeoglu, Gokhan Ozyigit &amp; Cuneyt Ebruli, Basic RadiationOncology, e-ISBN: 978-3-642-11666-7</li> <li>• Practical Radiotherapy Planning By Ann Barrett, Stephen Morris, Jane Dobbs, Tom Roques 4<sup>th</sup> edition 2009</li> <li>• Strategies for Radiation Therapy Treatment Planning 1st Edition by Ping Xia PhD,Andrew Godley PhD , Chirag Shah MD 2018</li> <li>• Handbook of Treatment Planning in Radiation Oncology, 3rd Edition byVidetic, Gregory M. , Vassil, Andrew D., Woody, Neil M 2020</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures, Problem based learning, Tutorials Class discussion, Practical Demonstrations
<b>Course Objectives:</b>		<p>Up on completion of the course students should be able to:</p> <ul style="list-style-type: none"> <li>• Identify the types of simulators for radiological device.</li> <li>• Develop skills in producing an optimal 3 dimensional and IMRT dose distribution of breast, pelvic and head and neck region</li> <li>• Develop skills in Radiotherapy Physics treatment planning</li> <li>• Develop skills integrating Radiobiology in treatment planning. •</li> <li>• Evaluate the products as well as the process of preparation the treatment of these patients.</li> <li>• Develop skills in IGRT techniques.</li> <li>• Further develop communicative and co-operative skills.</li> </ul>



	<ul style="list-style-type: none"> <li>• Have insight into the role of the Radiotherapy-technician in relation to the organization of a Radiotherapy department in the Netherlands.</li> <li>• Produce an optimal 3 D dose distribution.</li> <li>• Produce an IMRT dose distribution</li> <li>• Argue the choices you made. • Be able to reflect on your products and your process</li> <li>• Familiar with special computer programs and radiotherapy plans</li> <li>• Understand methods of evaluating radiological treatment plans for patients with cancerous tumor.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1 &amp; 2)</b>	Principles of treatment planning
<b>Session 2 (Week 3 &amp; 4)</b>	Methods of treatment by ionizing radiation
<b>Session 3 (Week 5 &amp; 6)</b>	Radiotherapy Procedure
<b>Session 4 (Week 7 &amp; 8)</b>	Radiotherapy simulation
<b>Session 5 (Week 9 &amp; 10)</b>	CT Simulation
<b>Session 6 (Week 11 &amp; 12)</b>	Cobalt-60 teletherapy unit (Co-60)
<b>Session 7 (Week 13, 14, 15)</b>	Linear Accelerator (Linac)
<b>Session 8 (Week 16)</b>	<b>Midterm exam</b>
<b>Session 9 (Week 17)</b>	Kilo-voltage X-ray therapy machine
<b>Session 1 (Week 18 &amp; 19)</b>	X-ray Therapy Machine
<b>Session 11 (Week 20)</b>	Superficial x-ray radiotherapy
<b>Session 12 (Week 21)</b>	Ortho-voltage x-ray radiotherapy
<b>Session 13 (Week 22)</b>	Brachytherapy and External beam radiotherapy techniques
<b>Session 14 (Week 23)</b>	Patient positioning and immobilization
<b>Session 15 (Week 24,25)</b>	Immobilization systems and Beam Modifiers
<b>Session 16 (Week 26)</b>	Process of preparing focalized blocks
<b>Session 17 (Week 27)</b>	Matching of adjoining Fields
<b>Session 18 (Week 28)</b>	Methods of Field Separation and Guidelines for field matching
<b>Session 19 (Week 29)</b>	Revision (questions answering and discussion).
<b>Session 22 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		This course describes the modern techniques in radiotherapy including the use of equipment, selection and use of accessories and patient setup.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>Walter and Miller, "A short Text book of Radiotherapy", 4<sup>th</sup> edition, Churchill Livingstone.</li> <li>Principles and Practice of Modern Radiotherapy Techniques in Breast Cancer 2013<sup>th</sup> Edition by Ayfer Haydaroglu , Gokhan Ozyigit 2012</li> <li>Monte Carlo Techniques in Radiation Therapy by Joao Seco and Frank Verhaegen 1<sup>st</sup> edition 2013</li> <li>Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lectures, Problem based learning, Tutorials (office hours) Class discussion, Practical Demonstrations
<b>Course Objectives:</b>		At the end of the course the student should be able to: <ul style="list-style-type: none"> <li>Describe the modern techniques required for patient setup.</li> <li>Protect the critical organs, minimize and deal with the radiation sickness.</li> <li>Reproduce the same setup every session.</li> <li>Follow up patient's condition during the radiation course.</li> </ul>
<b>Course Assessments</b>		Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>		<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>		Introduction To Radiation Oncology
<b>Session 2 (Week 2)</b>		Cancer Definition and Different types of Cancers
<b>Session 3 (Week 3)</b>		The Beginning of Cancerous Growth
<b>Session4 (Week 4)</b>		Tumors (neoplasm)
<b>Session 5 (Week 5)</b>		Malignant versus Benign tumors
<b>Session 6 (Week 6)</b>		Why Cancer is potential dangerous
<b>Session 7 (Week 7)</b>		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)	<b>Midterm exam</b>
Session17(Week17)	Types and steps of Radiation Therapy
Session18(Week18)	Other Types of Radiation Therapy Radiotherapy Accidents
Session19(Week19)	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)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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:		<ul style="list-style-type: none"> <li>• Brennan P, Seeram E. <i>Digital Radiography</i>. Blackwell Publishing Professional, 2007 ISBN 0632064714</li> <li>• Quality and Safety in Radiotherapy Edited By Todd Pawlicki, Peter Dunscombe, Arno J. Mundt, Pierre Scalliet 1<sup>st</sup> edition 2020</li> <li>• PODGORSAK, E.B., editor, Radiation Oncology Physics: A Handbook for Teachers and Students, 2005, Vienna (2005).</li> <li>• IPEM, Report 81: Physics aspects of quality control in radiotherapy, York (1999).</li> <li>• MUTIC, S., et al., Quality assurance for computed-tomography simulators and the</li> <li>• computed-tomography-simulation process: report of the AAPM Radiation Therapy Committee Task Group No. 66, Med Phys 30 10 (2003) 2762-92.</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
Course Duration		4 * 28 = 112 teaching hours
Delivery		Lectures, Problem based learning, Tutorials Class discussion, Practical Demonstrations





<b>Course Objectives:</b>	<p>By the end of this course participants should be able to:</p> <ul style="list-style-type: none"> <li>• Know the basic rules of digital photograph</li> <li>• Knowing how to acquire a digital image and the errors that prevent its acquisition</li> <li>• Evaluate the digital image.</li> <li>• Display the image on a screen - or a movie</li> <li>• 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</li> <li>• Understand the cause, frequency and effects of incidents/accidents in a radiotherapy department</li> <li>• 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)</li> <li>• Know how to communicate around radiotherapy incidents, with the patient and his/her relatives, within the department itself and with the media.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction
<b>Session 2 (Week 2)</b>	Digital image characteristics
<b>Session 3 (Week 3)</b>	Digital receptors
<b>Session 4 (Week 4 &amp; 5)</b>	Comparison of detector properties and evaluative criteria
<b>Session 5 (Week 6)</b>	Cassette-based systems
<b>Session 6 (Week 7)</b>	Cassette-less systems
<b>Session 7 (Week 8 &amp; 9)</b>	Strong dependence of image quality on
<b>Session 8 (Week10&amp; 11)</b>	Dynamic range vs. film and exposure latitude
<b>Session 9 (Week12&amp;13 )</b>	Image Acquisition
<b>Session10(Week14&amp;15&amp;16)</b>	Image extraction – cassette-based system
<b>Session 11 (Week 17)</b>	<b>Midterm exam</b>
<b>Session 12(Week 18&amp;19)</b>	Exposure indicator
<b>Session 13 (Week20&amp;21)</b>	Image Acquisition Errors
<b>Session 14(Week22&amp;23)</b>	Exposure field recognition
<b>Session15Week 24)</b>	Nyquist criterion Software (Default) Image Processing
<b>Session16Week 25)</b>	Effects of excessive processing
<b>Session 17 (Week 26)</b>	Display
<b>Session 18(Week 27-28)</b>	Revision (questions answering and discussion).
<b>Session 19 (Week 29-30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Hospitals Practical Training II &amp; Case Study</b>
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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>Bontrager K. Pocket Atlas-Handbook of Radiographic Positioning and Techniques. 4th ed. St. Louis, Mo: Elsevier Mosby; 2002.</li> <li>Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	6 * 28 = 168 teaching hours
<b>Delivery</b>	Problem based learning, Tutorials (office hours).Class discussion, Practical Demonstrations
<b>Course Objectives</b>	<p>Up on completion of the course students should be :</p> <ul style="list-style-type: none"> <li>perform radiographic procedures of the clinical practice I.</li> <li>Able to perform the special examinations, tomography imaging ( CT &amp; MRI imaging), radiation protection, ethics and professional conducts.</li> <li>Carrying out anatomical and functional examinations of nuclear medicine technology, which include examinations of bones - brain - thyroid gland - liver and spleen - kidneys - lungs, etc.</li> </ul>





	<ul style="list-style-type: none"> <li>Acquire the skills of outlining, discussing, describing or using as well as writing reports about diagnostic procedures in medical imaging.</li> <li>They will also enumerate such procedure of cases of special interest such as dealing with certain pathological findings.</li> </ul>
<b>Course Assessments</b>	Clinical Practice 70%, Clinical Practice Record Book 20%. Activity 5 %, Attendance 5 %
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction
<b>Session 2 (Week 2 &amp; 3 )</b>	Upper limb Investigation
<b>Session 3 (Week 4 )</b>	Shoulder Investigation
<b>Session 4 (Week 5 &amp; 6 )</b>	Lower limb Investigations Pelvic girdle Investigations
<b>Session 5 (Week 7 )</b>	Chest Investigations
<b>Session 6 (Week 8)</b>	Abdomen Investigations
<b>Session 7 (Week 9 &amp;10)</b>	Spine Investigations
<b>Session 8 (Week 11&amp; 12)</b>	Skull ( all skull positioning)
<b>Session 9 ( Week 13, 14 &amp; 15)</b>	Contrast Media Investigations
<b>Session 10 (Week 16, 17 )</b>	Midterm exam and Mammography
<b>Session 11 (Week 18)</b>	Dental Radiography
<b>Session 12(Week 19 &amp; 20)</b>	Angiography
<b>Session 13 (Week 21 &amp; 22)</b>	Magnetic Resonance Imaging Applications
<b>Session 14(Week 23 &amp; 24,25 )</b>	CT scan Applications and Ultrasound Investigations
<b>Session 15 (Week 26 &amp; 27)</b>	Radiotherapy Techniques
<b>Session 16 (Week 28 &amp; 29)</b>	Nuclear Medicine Techniques
<b>Session 17 ( Start from the fourth week up to the end )</b>	Case Study
<b>Session 18 (Week30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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.





رابعاً: 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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Tidy's physiotherapy, Churchill Livingstone, Stuart Porter, Fourteenth Edition 2011.</li> <li>• Principle of physical therapy, Peter G. Tsarfia, M.D, Grune Stratton.</li> <li>• Complete reflexology ( therapeutic foot message for health and will-being ), Mustard 1999 Designed by The Bridgewater book company.</li> <li>• Principles of Exercises in Physiotherapy by C Sivaram 2009, DOI 10.5005/jp/books/10675</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation, practical.
<b>Course Objectives:</b>		<ul style="list-style-type: none"> <li>• Upon completion of this course, the student will have reliably demonstrated the ability to:</li> <li>• Use and apply each principle of physical therapy individually or all with the priority of one principle over the other.</li> <li>• 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</li> <li>• Apply the basic principles of physiotherapy towards the patient in practice.</li> <li>• Collect patient information and use it to plan for the patient.</li> </ul>





	<ul style="list-style-type: none"> <li>Stop one starter and replace it with another when necessary.</li> </ul> <p>Dr. General and Transferred Skills</p>
<b>Course Assessments</b>	Midterm exam 20 % Activities 10% Attendances 10%. Final Exam 60 %. A 60% is required for a pass in this course.
<b>Content Breakdown Topical Coverage</b>	Content Breakdown Topical Coverage
<b>Session 1 (Week 1)</b>	Definition & role of Physical therapy Methods of Physical therapy Characteristics of Physical Therapist Physical Therapy department Soft tissue manipulation
<b>Session 2 (Week 2)</b>	Manual massage: describe briefly the following: 1. History of massage. 2. Mechanical points to be considered. 3. Points to be considered while giving massage
<b>Session 3 (Week 3)</b>	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
<b>Session 4 (Week 4)</b>	Physiological effects of massage on various systems of body, effects on: Excretory system, circulatory system, muscular system, nervous system & metabolic system.
<b>Session 5 (Week 5 &amp; 6)</b>	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.
<b>Session 6 (Week 6 &amp; 7)</b>	. Massage for upper limb: Scapular region, Shoulder joint, Upper arm, Elbow joint, Forearm, Wrist joint and Hand.
<b>Session 7 (Week 8)</b>	Massage for lower limb: Thigh, Knee joint, Leg and Foot (including ankle joint and toes).
<b>Session8 (Week 9&amp; 10)</b>	Massage for back: Neck and Upper back, Middle and Lower back, Gluteal region
<b>Session 9(Week 11 &amp; 12)</b>	Massage for the face.
<b>Session 10 (Week 13)</b>	Connective tissue massage Define and describe the technique, effects & uses and contra- indications
<b>Session 11 (Week 14)</b>	<b>Midterm exam practical</b>
<b>Session 12 (Week 15)</b>	<b>Midterm Exam Theoretical</b>
<b>Session 13 (Week 16)</b>	Myofascial release: Define and describe the technique, effects & uses and contra- indications
<b>Session 14 (Week 17)</b>	Neural mobilization





	Define and describe the technique, effects & uses and contra-indications
<b>Session 15 (Week 18)</b>	Peripheral mobilization Define and describe the technique, effects & uses and contra-indications
<b>Session 16 (Week 19)</b>	Spray stretch technique Define and describe the technique, effects & uses and contra-indications
<b>Session 17 (Week 20)</b>	Gait Define and describe the technique, effects & uses and contra-indications
<b>Session 18 (Week 21)</b>	Uses of computer in physiotherapy Define and describe the technique, effects & uses and contra-indications
<b>Session 19 (Week 22)</b>	Newer techniques in message Define and describe the technique, effects & uses and contra-indications
<b>Session 20 (Week 23)</b>	Acupressure Define and describe the technique, effects & uses and contra-indications
<b>Session 21 (Week 24)</b>	Isokinetic training Define and describe the technique, effects & uses and contra-indications
<b>Session 22 (Week 25)</b>	Electro diagnosis Define and describe the technique, effects & uses and contra-indications
<b>Session 23 (Week 26)</b>	Specific uses of message Define and describe the technique, effects & uses and contra-indications
<b>Session 24 (Week 27)</b>	Reflexology Define and describe the technique, effects & uses and contra-indications
<b>Session 25 (Week 28)</b>	Biomechanics Define and describe the technique, effects & uses and contra-indications
<b>Session 26 (Week 29)</b>	Exercise in rehabilitation Define and describe the technique, effects & uses and contra-indications
<b>Session 27 (Week 30)</b>	Revision (Discussion and questions answering).
<b>Session 28(Week 31)</b>	<b>Final Exam practical</b>
<b>Session 29 (Week 32)</b>	<b>Final Exam Theoretical</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.






<b>Course Change</b>	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.
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## Human Anatomy


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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Essentials of Human Anatomy &amp; Physiology by Elaine Marieb 10th Edition or later (recommended).</li> <li>• Human Anatomy &amp; Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn.</li> <li>• Introduction to the Human Body, 10th Edition</li> <li>• Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
<b>Course Objectives:</b>	Upon completion of this course, the student will have reliably demonstrated the ability:



	<ul style="list-style-type: none"> <li>• 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;</li> <li>• Describe the major cavities of the body and the organs they contain.</li> <li>• Explain what a cell is? and explain how human organs and systems interact.</li> <li>• Describe the major functions of the four types of human tissue.</li> <li>• List the major systems of the body, the organs they contain and the functions of those systems.</li> <li>• Define the terms anatomy and physiology.</li> <li>• Define homeostasis.</li> <li>• Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1-2)</b>	<ul style="list-style-type: none"> <li>• Introduction to Anatomy</li> <li>• Levels of organization</li> <li>• Body regions, planes, and orientations and body cavities</li> </ul>
<b>Session 2 (Week 3-4)</b>	<ul style="list-style-type: none"> <li>• Skeletal system</li> <li>• Bone structure and types, cartilage, ligaments, tendons, and joints</li> <li>• Axial and appendicular skeletons</li> <li>• Scientific terminologies of the main body bones</li> </ul>
<b>Session 3 (Week 5-6)</b>	<ul style="list-style-type: none"> <li>• Muscular system</li> <li>• Types of muscles, Differences and their microscopic structure</li> <li>• Skeletal muscle structure and neuromuscular junction</li> <li>• Scientific terminologies of the main body Muscles</li> </ul>
<b>Session 4 (Week 7-9)</b>	<ul style="list-style-type: none"> <li>• Cardiovascular (Circulatory) system</li> <li>• Components of cardiovascular system and types of circulations</li> <li>• The heart, arteries, veins, capillaries, and lymphatic vessels</li> <li>• The blood components (plasma and blood cells</li> <li>• Scientific terminologies of the main cardiovascular components</li> </ul>
<b>Session 5 (Week 10-11)</b>	<ul style="list-style-type: none"> <li>• Respiratory system</li> <li>• Upper respiratory system (nose, pharynx, larynx, and trachea)</li> <li>• Lower respiratory system (Lungs, thoracic cage, and pleura)</li> <li>• Bronchi, bronchioles, alveoli and respiratory membrane</li> <li>• Respiratory muscles and lung volumes and capacities</li> <li>• Scientific terminologies of the main respiratory system parts</li> </ul>
<b>Session 6 (Week 12-14)</b>	<ul style="list-style-type: none"> <li>• Digestive system</li> <li>• Upper digestive system (mouth, pharynx, and esophagus)</li> <li>• Lower digestive system (stomach, small intestine, and large intestine)</li> <li>• Structure of digestive system walls</li> <li>• Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gall bladder)</li> </ul>



	<ul style="list-style-type: none"> <li>• Scientific terminologies of the main Digestive system parts</li> </ul>
<b>Session 7 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 8(Week 16-17)</b>	<ul style="list-style-type: none"> <li>• Integumentary system</li> <li>• Skin structure and types</li> <li>• Skin layers and skin color</li> <li>• Receptors and glands</li> <li>• Skin burns and disorders</li> <li>• Scientific terminologies of the main skin structures</li> </ul>
<b>Session 9 (Week 18-19)</b>	<ul style="list-style-type: none"> <li>• Urinary system</li> <li>• The main parts of the urinary system</li> <li>• Kidney structure</li> <li>• Nephron and Glomerulus</li> <li>• Types of blood vessels in the kidney</li> <li>• Uterus, bladder and urethra</li> <li>• Scientific terminologies of the main urinary system parts</li> </ul>
<b>Session 10 (Week 20-22)</b>	 <ul style="list-style-type: none"> <li>• Endocrine system</li> <li>• Endocrine glands names and locations</li> <li>• Structure, location, and hormones of hypothalamus and pituitary gland</li> <li>• Structure, location, and hormones of thyroid and parathyroid glands</li> <li>• Structure, location, and hormones of pineal and thymus glands</li> <li>• Structure, location, and hormones of pancreas and adrenal glands</li> <li>• Structure, location, and hormones of the ovaries and testicles gland</li> <li>• Structure, location, and hormones of other glandular structures</li> <li>• Scientific terminologies of the main endocrine glands</li> </ul>
<b>Session 11 (Week 23-24)</b>	<ul style="list-style-type: none"> <li>• Reproductive system</li> <li>• Reproductive systems of male and female</li> <li>• Structure and hormones of the ovaries and testes</li> <li>• Production of the sperms and ova</li> <li>• Scientific terminologies of the main parts of reproductive system parts</li> </ul>
<b>Session 12 (Week 25-26)</b>	<ul style="list-style-type: none"> <li>• Central Nervous system</li> <li>• brain, spinal cord, &amp; peripheral nerves</li> <li>• Neurons (types and structure)</li> <li>• Neurotransmitters and synapses</li> <li>• Scientific terminologies of the main parts of the central nervous system parts</li> </ul>
<b>Session 13 (Week 27-28)</b>	<ul style="list-style-type: none"> <li>• Autonomic Nervous system</li> <li>• Sympathetic and parasympathetic autonomic nervous system</li> <li>• Preganglionic and postganglionic neurons</li> <li>• Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system</li> <li>• Scientific terminologies of the main parts of the autonomic nervous system parts</li> </ul>
<b>Session 14 (Week 29)</b>	Revision and discussion
<b>Session 15 (Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Lippincott's Illustrated Reviews: Biochemistry. ISBN-13: 978-1496344496 ISBN-10: 1496344499.</li> <li>• Harper's Illustrated Biochemistry. ISBN-13: 978-1259837937. ISBN-10: 1259837939.</li> <li>• Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148.</li> <li>• Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840.</li> <li>• Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> <li>• <a href="http://www.kume.edu/biochemistry/resource.html">http://www.kume.edu/biochemistry/resource.html</a></li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis.</li> <li>• 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.</li> <li>• The tools used in biochemistry, and their potential applications to medical technology science.</li> </ul>



	<ul style="list-style-type: none"> <li>• The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals.</li> <li>• Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body.</li> <li>• Identify and explain the structure and functions of each body system.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• Introduction and definition of biochemistry</li> </ul>
<b>Session 2 (Week 2)</b>	Biochemistry of the cell
<b>Session 3 (Week 3&amp;4)</b>	<ul style="list-style-type: none"> <li>• Body fluids of the cell</li> </ul>
<b>Session 4 (Week 5 &amp; 6)</b>	<ul style="list-style-type: none"> <li>• biochemistry of the cell</li> </ul>
<b>Session 5(Week 7,8)</b>	<ul style="list-style-type: none"> <li>• Chemistry of Carbohydrate</li> </ul>
<b>Session6(Week 9)</b>	<ul style="list-style-type: none"> <li>• Nucleotide</li> </ul>
<b>Session 7(Week 10)</b>	<ul style="list-style-type: none"> <li>• Nucleic acid</li> </ul>
<b>Session 8(Week 11)</b>	<ul style="list-style-type: none"> <li>• Chemistry of Lipids</li> </ul>
<b>Session9(Week 12)</b>	<b>Midterm Exam</b>
<b>Session10(Week 13)</b>	<ul style="list-style-type: none"> <li>• Chemistry of Lipids</li> </ul>
<b>Session11(Week 14 &amp; 15)</b>	<b>Midterm practical exam</b>
<b>Session12(Week 16)</b>	<ul style="list-style-type: none"> <li>•Enzymes</li> </ul>
<b>Session13(Week 17)</b>	<ul style="list-style-type: none"> <li>• Porphyrins</li> </ul>
<b>Session14(Week 18 &amp; 19)</b>	Hemoglobin
<b>Session15(Week 20)</b>	<ul style="list-style-type: none"> <li>•Vitamins</li> </ul>
<b>Session16(Week 21)</b>	Revision of lecture
<b>Session17(Week22 &amp; 23)</b>	<ul style="list-style-type: none"> <li>•Carbohydrate Metabolism</li> </ul>
<b>Session18(Week 24 &amp; 25)</b>	<ul style="list-style-type: none"> <li>•Lipid metabolism</li> </ul>
<b>Session19(Week 26,27)</b>	<ul style="list-style-type: none"> <li>•Protein Chemistry and Metabolism</li> </ul>
<b>Session20(Week 28)</b>	Revision of lecture
<b>Session21 (Week 29)</b>	<b>Final practical Exam</b>
<b>Session22 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Text book of microbiology First Published in 2010 by Prem C. Bakliwal for Aavishkar Publishers ISBN 978-81-7910-306-7.</li> <li>• <a href="https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text Book of Microbiology.pdf">https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text Book of Microbiology.pdf</a></li> <li>• <a href="https://open.umn.edu/opentextbooks/textbooks/873">https://open.umn.edu/opentextbooks/textbooks/873</a></li> <li>• <a href="https://www.britannica.com/science/microbiology">https://www.britannica.com/science/microbiology</a></li> <li>• <a href="https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/1%3A_Introduction_to_Microbiology">https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/1%3A_Introduction_to_Microbiology</a></li> <li>• <a href="https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf">https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells.</li> <li>• Comprehend the fundamentals of molecular microbiology.</li> <li>• Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.</li> </ul>





	<ul style="list-style-type: none"> <li>Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health.</li> <li>Understand Microbial Cell Structure, Function and methabolism.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>Introduction, of microbiology</li> </ul>
<b>Session 2 (Week 2)</b>	History of Microbiology
<b>Session 2 (Week 3)</b>	<ul style="list-style-type: none"> <li>Defining Microbes and Basic concepts and scope of microbiology</li> </ul>
<b>Session 3 (Week 4)</b>	Pasteur and spontaneous Generation
<b>Session 4 (Week 5 &amp; 6)</b>	Types of microorganisms
<b>Session 5(Week 7,8)</b>	Classification of microorganisms
<b>Session6(Week 9)</b>	Immunization, antiseptics and antibiotics
<b>Session 7(Week 10)</b>	Microscopy
<b>Session 8(Week 11)</b>	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
<b>Session9(Week 12)</b>	Bacterial structure& composition
<b>Session10(Week 13)</b>	Bacterial Genetics
<b>Session11(Week 14 &amp; 15)</b>	Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
<b>Session12(Week 16)</b>	<b>Midterm exam</b>
<b>Session13(Week 17)</b>	Isolation and culturing of Bacteria
<b>Session14(Week 18 &amp; 19)</b>	Microbial metabolism
<b>Session15(Week 20)</b>	Classification of bactria
<b>Session16(Week 21)</b>	Dyes and staining (gram stain, acid fast staining, and other staining metods).
<b>Session17(Week22 &amp; 23)</b>	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
<b>Session18(Week 24 &amp; 25,26)</b>	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
<b>Session19(Week 27,28)</b>	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
<b>Session21 (Week 29)</b>	<b>Final practical Exam</b>
<b>Session22 (Week 30)</b>	<b>Final Exam</b>



<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Histology
2	<b>Course Code</b>	MT204
3	<b>Course type: /general/specialty/optional</b>	General
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	non
7	<b>Program offered the course</b>	Medical Laboratories Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• DiFiore's atlas of histology with functional correlations.</li> <li>• Junqueira's Basic Histology.</li> <li>• Histology: An Essential Textbook by D. J. Lowrie Jr 2020</li> <li>• Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021</li> <li>• Textbook of Histology by Leslie P. Gartner PhD 2021</li> <li>• Histology: A Text and Atlas 7<sup>th</sup> edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015</li> <li>• Wheater's Functional Histology: A Text and Colour Atlas 3<sup>rd</sup> edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours



<b>Delivery</b>	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
<b>Course Objectives:</b>	Upon completion of this course, the student will have reliably demonstrated the ability to: <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Understand the changes that occur to tissues</li> <li>• Identify the different types of tissues</li> <li>• Recognize the types of tissues and the mechanisms of identifying them</li> <li>• understand the various diagnostic tools and medical equipment in the correct way to discover histological changes</li> <li>• Understand how to distinguish tissue and how it develops</li> <li>• deduce the causes of the changes that have occurred within the tissues</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 % %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	• Introduction to histology • histology and its mode of study
<b>Session 2 (Week 2)</b>	• The cell
<b>Session 3 (Week 3)</b>	• Epithelial Tissue
<b>Session 4 (Week 4)</b>	• Connective tissue
<b>Session 5 (Week 5)</b>	• Cartilage
<b>Session 6 (Week 6)</b>	• Bone
<b>Session 7 (Week 7)</b>	• Bone.
<b>Session 8 (Week 8)</b>	Muscle Tissue
<b>Session 9 (Week 9)</b>	Nerve Tissue
<b>Session 10 (Week 10)</b>	• Nervous System
<b>Session 11 (Week 11)</b>	The Immune System &
<b>Session 12 (Week 12)</b>	Lymphoid Organs
<b>Session 13 (Week 13)</b>	Blood and Hemopoiesis
<b>Session 14 (Week 14)</b>	Endocrine System
<b>Session 15 (Week 15)</b>	Hormones
<b>Session 16 (Week 16)</b>	The integumentary system
<b>Session 17 (Week 17)</b>	The Circulatory system
<b>Session 18 (Week 18)</b>	The Circulatory system
<b>Session 19 (Week 19)</b>	The Circulatory system
<b>Session 20 (Week 20)</b>	• Respiratory system
<b>Session 21 (Week 21)</b>	Respiratory system






<b>Session 22 (Week 22)</b>	Respiratory system
<b>Session 23 (Week 23)</b>	Digestive system
<b>Session 24 (Week 24)</b>	The urinary system
<b>Session 25 (Week 25)</b>	The urinary system
<b>Session26(Week26- 27)</b>	Reproductive system
<b>Session 28 (Week 28)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b> 		<p>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&amp; muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1</li> <li>• Principles of anatomy and physiology/Arthur Gerard J., Bryan D. – 12<sup>th</sup> ed.ISBN 978-0-470-08471-7</li> <li>• Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		<p>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.</p>
<b>Course Objectives:</b>		<p>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:</p> <ul style="list-style-type: none"> <li>• Have sufficient basic knowledge in medical physiology.</li> <li>• Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.</li> <li>• State the functions of each organ system of the body, explain the mechanisms by which each functions, and</li> </ul>



	<p>relate the functions and the anatomy and histology of each organ system.</p> <ul style="list-style-type: none"> <li>• Understand and demonstrate the interrelations of the organ systems to each other.</li> <li>• Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses.</li> <li>• Explain the pathophysiology of common diseases related to the organ systems of the body</li> <li>• The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %  Attendance 10 %    Final Exam 60 %  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b> 	<p>Introduction, Autonomic nervous system, Blood, Nerve&amp; muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)</p> <ul style="list-style-type: none"> <li>▪ Inform students how student learning program of the year-wise has been organized</li> <li>Help students organize and manage their studies throughout the year▪</li> <li>▪ Inform students how student learning program of the year-wise has been organized</li> <li>Help students organize and manage their studies throughout the yea</li> <li>▪ Guide students on assessment methods, rules and regulations</li> <li>• Introduction ( Total body water , cell membrane and cell transport)</li> </ul>
<b>Session 2 (Week 2)</b>	<p>Autonomic Nervous System</p> <ul style="list-style-type: none"> <li>• Types Autonomic Nervous System</li> <li>• Chemical neurotransmitters</li> <li>• Function of sympathetic &amp; Parasympathetic</li> </ul> <p>Assignment 2 handed out</p>
<b>Session 3 (Week 3)</b>	<p>The blood:</p> <ul style="list-style-type: none"> <li>• Major components and function of the blood</li> <li>• Red &amp; white blood cells</li> <li>• Plasma protein and function</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Blood groups &amp; hemostasis</li> </ul> <p>Blood clotting disorders</p>
<b>Session 5 (Week 5)</b>	<p>Nerve &amp; Muscle</p> <ul style="list-style-type: none"> <li>• Structure of nerve cell</li> <li>• Properties of neuron</li> <li>• Resting membrane potential</li> </ul>
<b>Session 6 (Week 6)</b>	Nerve & Muscle



	<ul style="list-style-type: none"> <li>• Action potential</li> <li>• Excitation- contraction coupling</li> <li>• Mechanism of muscle contraction &amp; relaxation</li> </ul>
Session7(Week 7)	Cardiovascular system <ul style="list-style-type: none"> <li>• Anatomy of the heart</li> <li>• Functional properties of cardiac muscle</li> <li>• Action potential &amp; Conducting System</li> </ul>
Session 8(Week 8)	<ul style="list-style-type: none"> <li>• Cardiac Cycle &amp; Heart sound</li> <li>• Electrocardiograph</li> </ul>
Session 9(Week 9)	<ul style="list-style-type: none"> <li>• Blood pressure</li> <li>• Cardio dynamic</li> <li>• Arrhythmia &amp; circulatory Shock</li> </ul>
Session10(Week 10)	<ul style="list-style-type: none"> <li>• Arrhythmia</li> <li>• circulatory Shock</li> </ul>
Session11(Week 11)	Respiratory System <ul style="list-style-type: none"> <li>• Structure of the respiratory system</li> <li>• Lung volume &amp; Capacities</li> </ul>
Session12(Week 12)	<ul style="list-style-type: none"> <li>• Oxygen &amp; Carbon Dioxide in blood</li> <li>• Dissociation oxygen curve shift</li> </ul>
Session13(Week 13)	<ul style="list-style-type: none"> <li>• Transport carbon dioxide</li> <li>• Regulation of respiratory</li> <li>• Hypoxia</li> </ul>
Session14(Week 14)	Nervous System <ul style="list-style-type: none"> <li>• Division of the nervous system</li> <li>• Units of Nervous system</li> <li>• Types of Receptors</li> </ul>
Session15(Week 15)	<b>Midterm exam</b>
Session15(Week 16)	Nervous System: <ul style="list-style-type: none"> <li>• Properties of receptors, Synapse, Types of synapse, Mechanism of neurotransmitter</li> </ul>
Session16(Week 17)	<ul style="list-style-type: none"> <li>• Somatic sensation</li> <li>• Types Somatic sensation               <ul style="list-style-type: none"> <li>• Pain sensation</li> </ul> </li> <li>• Pathways</li> </ul>
Session17(Week 18)	<ul style="list-style-type: none"> <li>• Referred Pain</li> <li>• Pain Control System</li> </ul>
Session18(Week19)	Special senses <ul style="list-style-type: none"> <li>• Vision</li> <li>• Hearing</li> </ul>
Session19(Week 20)	<ul style="list-style-type: none"> <li>• Special senses</li> <li>• Gustation</li> <li>• Olfaction</li> </ul>
Session20(Week 21)	Gastrointestinal tract <ul style="list-style-type: none"> <li>• characteristics of gastrointestinal wall</li> <li>• Explain functional types of movements in GIT</li> <li>• Control of GIT</li> </ul>
Session21(Week 22)	<ul style="list-style-type: none"> <li>• GIT hormones and their role in digestive process</li> <li>• Describe GIT reflexes</li> <li>• Mastication and salivary secretions</li> </ul>
Session22 (Week 23)	<ul style="list-style-type: none"> <li>• Describe motor functions of stomach</li> <li>• Explain regulation of stomach emptying &amp; the composition, function and • regulation of gastric secretions</li> <li>• Vomiting reflex</li> </ul>





<b>Session23 (Week 24)</b>	<ul style="list-style-type: none"> <li>•Gall bladder and biliary tract</li> <li>•intestinal motility</li> <li>•Defecation reflex</li> </ul>
<b>Session25 (Week 25,26)</b>	Urinary system <ul style="list-style-type: none"> <li>•The kidney</li> <li>•Urine formation</li> <li>•Micturition</li> <li>•Renal failure</li> <li>•Male reproductive</li> <li>•Female reproductive</li> </ul>
<b>Session26 (Week 27,28)</b>	Endocrine System Pituitary gland Thyroid gland Parathyroid Adrenal gland Endocrine cell in other organs
<b>Session27 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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%
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		<p>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.</p> <p>Second part of the course will cover different teaching methods and techniques.</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Textbook of Medical Psychology Hardcover – January 1, 1961</li> <li>• <a href="https://bookauthority.org/books/best-medical-psychology-books">https://bookauthority.org/books/best-medical-psychology-books</a></li> <li>• <a href="https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4">https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4</a></li> <li>• Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001.</li> <li>• Armstrong, Thomas. Multiple Intelligences in the Classroom: 2<sup>nd</sup> Edition. Association for Supervision and Curriculum Development, 2000.</li> <li>• Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997.</li> <li>• Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003.</li> <li>• Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002.</li> <li>• Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.</li> </ul>





	<ul style="list-style-type: none"> <li>Teaching Techniques for Church Education. Evangelical Training Association, 1983.</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Up on completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>Understand the principle domains of psychology that are most relevant to medicine.</li> <li>Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings.</li> <li>Be familiar with the application of psychology in the wider practice of medicine.</li> <li>understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses.</li> <li>Will be able to define and list the fruits of the spirit.</li> <li>The student will be able to explain why the fruit of the spirit are important to believers.</li> <li>The student will be able to assess which fruits are most and least evident in their own lives.</li> <li>The student will develop a plan to practice more of the fruit of the spirit for the next week</li> <li>Understand the basics of the teaching methods</li> <li>Know different techniques of teaching and questions preparations.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An introduction to Medical psychology
<b>Session 2 (Week 2)</b>	Psychology and Medicine <ul style="list-style-type: none"> <li>Explain what the field of Psychology studies.</li> <li>Describe the different areas of Psychology.</li> <li>Describe the way by which Psychology is linked to Medicine.</li> </ul>
<b>Session 3 (Week3-4)</b>	Brain Mechanisms and Behaviour <ul style="list-style-type: none"> <li>Describe the basics of Neural Communication.</li> <li>Explain the Basic Structure and function of the Nervous system.</li> <li>Outline the link between biology and behavior.</li> </ul>
<b>Session 4 (Week 5)</b>	Senses and Integration on Senses <ul style="list-style-type: none"> <li>Describe the role and the importance of the different types of senses.</li> <li>Outline the main functional theories of vision.</li> <li>Outline the main functional theories of audition.</li> <li>Outline the main theories of somatosensation.</li> <li>Outline the main theories of the functions of smell</li> </ul>



<b>Session5 (Week 6)</b>	<ul style="list-style-type: none"> <li>• Perception, attention and Memory</li> <li>• Outline the role of the different types of perception.</li> <li>• Describe the main theories of visual perception.</li> <li>• Describe the main theories of auditory perception.</li> <li>• Outline the main types of attention.</li> <li>• Describe the main theories of attention.</li> <li>• Outline the main types of memory.</li> <li>• Describe the main theories of memory</li> </ul>
<b>Session 6 (Week 7)</b>	<p>Child Development (from birth to adolescence)</p> <ul style="list-style-type: none"> <li>• Describe the different stages of development from birth to adolescence.</li> <li>• Outline the main theories of child development.</li> <li>• Outline the main theories of early stages of language acquisition.</li> <li>• Describe the main theories of language development.</li> <li>• Outline the theories connecting language and cognition.</li> <li>• Language and the brain.</li> </ul>
<b>Session 7(Week 8)</b> 	<p>Language, Motivation and Emotions</p> <p>Individual Differences in Intelligence and Personality</p> <ul style="list-style-type: none"> <li>• Outline the area of Motivation.</li> <li>• Outline the way by which motivation is link with emotion.</li> <li>• Outline the main theories of Emotions.</li> <li>• Describe the biological theories of emotions.</li> <li>• Describe the psychological theories of emotions.</li> <li>• Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools.</li> <li>• Outline the main Psychometric tools and their role in diagnosis.</li> <li>• Outline the main Personality tests and their value in clinical assessment.</li> </ul>
<b>Session 8 (Week 9)</b>	<p>Adulthood and Sexual Behaviour</p> <ul style="list-style-type: none"> <li>• Describe the characteristics of Adulthood.</li> <li>• Outline the interconnection between psychological and biological characteristics of this stage of human development.</li> <li>• Distinguish between Psychoanalytic and Psychological views on sexuality.</li> <li>• Describe the role of sex in human relationships</li> <li>• Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.</li> </ul>
<b>Session 9 (Week 10)</b>	<ul style="list-style-type: none"> <li>• Sleep, Consciousness, Family Aging, Death and Bereavement</li> <li>• Explain the different stages of sleep as described by EEG studies</li> </ul> <p>Outline the three theories of sleep.</p> <ul style="list-style-type: none"> <li>• Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation.</li> <li>• Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.</li> </ul>



	<ul style="list-style-type: none"> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> </ul>
<b>Session 10 (Week 11)</b>	<p>Psychology and Medicine: Patients and Doctors</p> <ul style="list-style-type: none"> <li>• Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions.</li> <li>• Outline the Biomedical and the Biopsychosocial Approaches to Medicine.</li> <li>• Identify the advantages and disadvantages of each approach in the development of modern medicine.</li> <li>• Outline the impact of psychological principles in doctor patient contact and communication.</li> </ul>
<b>Session 11 (Week 12)</b>	<p>Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment</p> <ul style="list-style-type: none"> <li>• Describe the different factors contributing to the impact that hospitalisation has on people.</li> <li>• Describe the potential psychological impact that hospitalisation may have on people.</li> <li>• Outline the role of psychosocial approaches in medical practice.</li> <li>• Outline the role of placebo effect in the treatment of both physical and psychological treatments.</li> <li>• Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis.</li> <li>• Outline the way by which psychological factors contribute to the development of somatic problems.</li> <li>• Describe different types of psychosomatic problems.</li> <li>• Outline possible ways of distinguishing between psychosomatic and physical problems.</li> </ul>
<b>Session 12 (Week 13)</b>	<p>Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation</p> <ul style="list-style-type: none"> <li>• Outline the psychological factors contributing to coping with illness and disability.</li> <li>• Describe the different approaches and techniques employed for coping with these difficulties.</li> <li>• Outline the different areas of Psychopathology.</li> <li>• Outline the methods employed in the diagnosis of psychological and psychiatric disorders.</li> <li>• Outline the treatments often used in the treatment of psychiatric and psychological disorders.</li> <li>• Explain what is meant by chronic mental illness and the process of rehabilitation.</li> </ul>
<b>Session 14 (Week 14)</b>	<b>Midterm Exam</b>





Session 16 (Week 16)	<ul style="list-style-type: none"> <li>• Teaching Principles</li> </ul>
Session 17 (Week 17)	<ul style="list-style-type: none"> <li>• Student Centered vs. Teacher Centered Learning</li> </ul>
Session 18 (Week 18)	<ul style="list-style-type: none"> <li>• Learning Styles</li> </ul>
Session 19 (Week 19)	<ul style="list-style-type: none"> <li>• Creating a Lesson: Overview</li> <li>• Creating a Lesson: Goals</li> <li>• Creating a Lesson: Outcomes</li> </ul>
Session 20 (Week 20)	<ul style="list-style-type: none"> <li>• Creating a Lesson: Information Delivery</li> </ul>
Session 21(Week 21-22)	<ul style="list-style-type: none"> <li>• Teaching Methods</li> </ul>
Session 22 (Week 23)	<ul style="list-style-type: none"> <li>• Creating a Lesson: Activities</li> </ul>
Session 23 (Week 24)	<ul style="list-style-type: none"> <li>• Creating a Lesson: Measurement</li> </ul>
Session 24 (Week 25)	<ul style="list-style-type: none"> <li>• Creating a Lesson: Evaluation</li> </ul>
Session 25 (Week 26)	<ul style="list-style-type: none"> <li>• The Teacher's Responsibilities</li> </ul>
Session26(Week27-28)	<ul style="list-style-type: none"> <li>• Presentations</li> </ul>
Session27(Week29)	Revision and discussion
Session28(Week 30-32)	<b>Final Exam</b>
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								
<b>Brief Description:</b>		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.								
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير</li> <li>• مقدمة في زراعه الاعضاء، د. الهادي عصمان</li> <li>• WMA medical ethics manual 2015</li> <li>• <u>Principles of Biomedical Ethics, 5th edn.</u></li> <li>• <a href="https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4">https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4</a></li> </ul>								
<b>Course Duration</b>		2 * 28 = 56 teaching hours								
<b>Delivery</b>		Lectures, Problem based learning and Class discussion.								
<b>Course Objectives:</b>		<p>This course introduces medical technology students to the field of medical ethics. The objective of the course is:</p> <ul style="list-style-type: none"> <li>• To convey to students, the pivotal role ethics holds in medical practice.</li> <li>• It introduces the key underlying ethical principles required in medicine.</li> <li>• The application of these principles will be brought to life through case based learning (CBL).</li> <li>• Recognize ethical issues when they arise in their practice</li> <li>• Deal with these issues in a systematic manner</li> <li>• Understand the ethics of medical research</li> <li>• To create an awareness on medical Ethics and Human Values.</li> <li>• To instill Moral and Social Values and Loyalty</li> <li>• To appreciate the rights of others.</li> </ul>								
<b>Course Assessments</b>		<table border="0"> <tr> <td>Midterm exam</td> <td>20 %</td> <td>Activity</td> <td>10 %</td> </tr> <tr> <td>Attendance</td> <td>10 %</td> <td>Final Exam</td> <td>60 %</td> </tr> </table>	Midterm exam	20 %	Activity	10 %	Attendance	10 %	Final Exam	60 %
Midterm exam	20 %	Activity	10 %							
Attendance	10 %	Final Exam	60 %							





	A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
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
Session 5 (Week 8 - 9)	Informed consent
Session 6 (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)	<b>Med term exam</b>
Session 12 (Week 17-18)	Medical errors
Session 13 (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 (Week 26-27)	Theories of ethics
Session 18 (Week 28)	Revision and discussion
Session 19 (Week 29-32)	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		<p>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:</p> <p>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</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>Principles of Hospital Administration and Planning (First Edition: 1998, Second Edition: 2009 ISBN 978-81-8448-632-2).</li> <li>Buchbinder, S.B., &amp; Shanks, N.H. (2012). Introduction to Health Care Management Jones &amp; Bartlett, Publishers, 2nd Edition.</li> <li>Essential Textbook of Health Management 3. July 2019: Publisher: Samiksha Publication ISBN: 978-9937710-55-8.</li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		2 * 28 = 56 teaching hours
<b>Delivery</b>		A Lecture-based ppt and practical training B Group interaction and discussion
<b>Course Objectives:</b>		<p>Up on completion of the course the students will be able to:</p> <ul style="list-style-type: none"> <li>Learn concepts and theories in health care management;</li> <li>Develop skills in using materials tools and/or technology central to health care mgt;</li> <li>Learn to understand perspectives and values of health care management;</li> <li>Develop the basic management skills and ability to work productively with others;</li> <li>Learn to select, use, and critically analyze current HCMN research and literature;</li> </ul>





	<ul style="list-style-type: none"> <li>• Integrate health care management theory with real world situations</li> <li>• Develop the ability to work productively with others in diverse teams.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An Introduction to the Health management
<b>Session 2 (Week 2)</b>	The historical role of medical and nursing health services
<b>Session 3 (Week 3)</b>	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
<b>Session 6(Week 6)</b>	Hospital concept and classification hospital environment
<b>Session 7 (Week 7)</b>	Hospital health planning
<b>Session 8 (Week 8)</b>	The organizational structure of the hospital
<b>Session 9(Week 9)</b>	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
<b>Session 10(Week 10)</b>	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
<b>Session 11(Week 11)</b>	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
<b>Session 12(Week 12)</b>	Leadership and management An overview of healthcare management and leadership
<b>Session 13(Week 13)</b>	Management and motivation
<b>Session 14(Week 14)</b>	<b>Midterm Exam</b>
<b>Session 15(Week 15)</b>	Organizational Behavior (OB) and Management Thinking
<b>Session 16(Week 16)</b>	Quality Improvement
<b>Session 17(Week 17)</b>	Health care information Technology Health and Nursing Information Collection System
<b>Session 18(Week 18)</b>	Healthcare Financing, Cost and revenue management
<b>Session 19(Week 19-20)</b>	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources



<b>Session 20(Week 21)</b>	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
<b>Session 21(Week22)</b>	Fraud and abuse
<b>Session 22(Week 23)</b>	Communication, health administration
<b>Session 23(Week 24)</b>	Administrative Support in Healthcare Organizations
<b>Session 24(Week 25)</b>	Clinical Care in Healthcare Organizations
<b>Session 25(Week 27)</b>	Medical Laboratories Management
<b>Session 26(Week 28)</b>	Revision and discussion
<b>Session 27(Week 29-30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Tidy's physiotherapy, Churchill Livingstone, Fourteenth Edition 201, Stuart Porter.</li> <li>• Muscle Testing. Techniques of manual examination, W.B. Saunders Company, 6<sup>th</sup> Edition, Helen J. Hislop &amp; Jacqueline Montgomery.</li> <li>• Measurement of joint motion, F.A. Davis Company, 4<sup>th</sup> Edition, Cynthia C. Norkin &amp; D. Joyco White.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based presentation, group interaction and discussion, and active participation.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand how to use the right way to make a general assessment and patient evaluation.</li> <li>• Do manual muscle testing for each muscle of the human body.</li> <li>• 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.</li> <li>• 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.</li> <li>• Identify the problem, disease or disorder the patient has construct a series of outcome measures and therapeutic plan</li> <li>• Write well developed case report</li> <li>• Respect the patient's privacy and preserve confidentiality.</li> </ul>





<b>Course Assessments</b>	Midterm exam 20 % 10 % Final Exam 60 % in this course.	Activity 10 %	Attendance A 60% is required for a pass
<b>Content Breakdown</b>	<b>Topics Coverage</b>		
<b>Session 1 (Week 1 )</b>	Introduction to testing and measurement methods		
<b>Session 2 (Week 2 &amp; 3)</b>	<b>General criteria for patient evaluation</b> .Describe the general patient evaluation List the factors that may contribute to restricting human movement and normal motion. Diseases		
<b>Session 3 (Week 4-12)</b>	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		
<b>Session 4 (Week 13)</b>	<b>Midterm practical Exam</b>		
<b>Session 5 (Week 14)</b>	<b>Midterm Exam theoretical</b>		
<b>Session 6 (Week 15-17)</b>	Cervical spine ROM measurement		
<b>Session 7 (Week 18-22)</b>	Lumbar spine ROM measurement		
<b>Session 8 (Week 23-25)</b>	Upper limbs ROM measurement		
<b>Session 9(Week25-26)</b>	Lower limbs ROM measurement		
<b>Session 10(Week 27)</b>	Management of cerebral palsy		
<b>Session 11(Week 28)</b>	Normal & abnormal functional ability of each motor joint.		
<b>Session 12(Week 28)</b>	Revision and discussion		
<b>Session 13(Week30-32)</b>	<b>Final Exam</b>		
<b>Attendance Expectations</b>	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.		
<b>Generic Skills</b>	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.		
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Essential paediatrics by David Hull / Derek Johnston 4<sup>th</sup> Edition or later.</li> <li>• Pediatric Rehabilitation (Principles and Practice) by Michael Alexander / Dennis Matthews. Fourth Edition (or later)</li> <li>• Therapeutic Exercise, foundations and techniques by Carolyn Kisner / Lynn Colby 6<sup>th</sup> Edition</li> <li>• Journal of Physical Therapy and Pediatric Physical therapy</li> <li>• <a href="http://www.actionsportphysio.com/en/services/treatments/physiotherapy-pediatric-approach/">http://www.actionsportphysio.com/en/services/treatments/physiotherapy-pediatric-approach/</a></li> <li>• <a href="http://www.beh-mht.nhs.uk/enfield-community-services/ecs-services/paediatric-physiotherapy.htm">http://www.beh-mht.nhs.uk/enfield-community-services/ecs-services/paediatric-physiotherapy.htm</a></li> <li>• <a href="http://apcp.csp.org.uk/">http://apcp.csp.org.uk/</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based presentation, group interaction and discussion, and active participation.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand normal developmental milestone</li> <li>• Identify the problem, disease or disorder the patient has</li> <li>• Recognize the motor and/or functional needs of each case</li> <li>• Construct a series of outcome measures and therapeutic plan</li> <li>• Write well developed case report</li> </ul>



	<ul style="list-style-type: none"> <li>Respect the patient's privacy and preserve confidentiality</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 %      A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topical Coverage</b>
<b>Session 1 (Week 1 &amp; 2)</b>	<ol style="list-style-type: none"> <li>Describe <b>growth and development</b> of a child from birth to 12 years: including physical, social, adaptive development.</li> <li>List <b>the maternal and neonatal factors contributing to high risk pregnancy</b>. 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, tuberculosis, diabetes, epilepsy; bleeding in the mother at any trimester.</li> <li>Briefly describe <b>community programmes: International (WHO) national and local</b>, for prevention of poliomyelitis, blindness, deafness, mental retardation and hypothyroidism, Outline the immunization schedule for children.</li> </ol>
<b>Session 2 (Week 3, 4 &amp; 5)</b>	<b>Reflex maturation testing</b> <ol style="list-style-type: none"> <li>Spinal and brain stem reflexes (primitive reflexes).</li> <li>Midbrain level (Righting reactions).</li> <li>Cortical level (Equilibrium and protective reactions).</li> </ol> Training on who to practice the above reflex maturation testing
<b>Session 3 (Week 6,7,8 &amp;9)</b>	<b>Cerebral palsy</b> <ol style="list-style-type: none"> <li>Define and briefly outline etiology prenatal and post natal causes.</li> <li>Briefly mention pathogenesis.</li> <li>Classification of cerebral palsy.</li> <li>Associated problems.</li> <li>Physical therapy Assessment of cerebral palsy.               <ol style="list-style-type: none"> <li>Assessment of movement.</li> <li>Assessment of postural control.</li> <li>Assessment of postural tone.</li> <li>Musculoskeletal assessment.</li> <li>Assessment of gross &amp; fine motor skills.</li> <li>Evaluation of gait.</li> </ol> </li> <li>Describe Physiotherapy management of cerebral palsy.               <ol style="list-style-type: none"> <li>Functional ability.</li> <li>Muscle testing.</li> <li>ROM testing.</li> </ol> </li> <li>Briefly describe medical treatment.</li> <li>Describe Physical therapy treatment.               <ol style="list-style-type: none"> <li>Handling technique</li> <li>Prevent deformity.</li> <li>Prolonging ambulation.</li> <li>Wheelchair use.</li> <li>Orthoses.</li> <li>Weight control.</li> <li>Minimizing spinal deformity.</li> <li>Activities of daily living.</li> <li>Facilitation of family support.</li> </ol> </li> </ol>





	<ul style="list-style-type: none"> <li>j. Facilitating sleep.</li> <li>k. Management of pain.</li> <li>l. home exercises</li> </ul> <p>9. Occupational therapy</p>
<b>Session 4 (Week 10,11 )</b>	<p><b>Erb's palsy</b></p> <ul style="list-style-type: none"> <li>1. Define and outline the etiology.</li> <li>2. Risk factors</li> <li>3. Associated problems.</li> <li>4. Physical therapy assessment. <ul style="list-style-type: none"> <li>a. Informal assessment.</li> <li>b. Muscle tone assessment.</li> <li>c. Muscle test: manual muscle test &amp; functional muscle test (before 3 years of age).</li> <li>d. ROM test.</li> <li>e. Test of tightness.</li> <li>f. Long &amp; Round measurement.</li> <li>g. Fine motor development test.</li> </ul> </li> <li>5. Describe Physical therapy management. <ul style="list-style-type: none"> <li>a. Handling technique</li> <li>b. Strengthening exercises</li> <li>c. ROM exercises</li> <li>d. Electrotherapy</li> <li>e. constraint induced therapy</li> <li>f. parent education</li> <li>g. home exercises</li> </ul> </li> <li>6. Occupational therapy</li> </ul>
<b>Session 5 (Week 12 &amp; 13)</b>	 <p><b>Congenital muscular torticollis</b></p> <ul style="list-style-type: none"> <li>1. Define and outline etiology.</li> <li>2. Associated problems.</li> <li>3. Physical therapy assessment. <ul style="list-style-type: none"> <li>a. History.</li> <li>b. Informal evaluation.</li> <li>c. ROM test.</li> </ul> </li> <li>4. Describe Conservative management (physical therapy treatment).</li> <li>5. Briefly outline surgical management.</li> <li>6. Physical therapy for post-operative cases. <ul style="list-style-type: none"> <li>a. Handling technique</li> <li>b. Strengthening exercises</li> <li>c. ROM exercises</li> <li>d. Parent education</li> <li>g. Home exercises</li> </ul> </li> </ul>
<b>Session 6 (Week 14)</b>	<b>Midterm Exam</b>
<b>Session 7 (Week 15 16&amp; 17)</b>	<p><b>Club foot deformity</b></p> <ul style="list-style-type: none"> <li>1. Define and outline etiology.</li> <li>2. Physical therapy assessment. <ul style="list-style-type: none"> <li>a. Informal evaluation.</li> <li>b. ROM test.</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>c. Muscle test: manual muscle test &amp; functional muscle test.</li> <li>d. Developmental test.</li> <li>e. Long and Round measurements.</li> </ul> <p>3. Describe Physical therapy treatment.</p> <ul style="list-style-type: none"> <li>a. Reflex activities</li> <li>b. Strengthening exercises</li> <li>c. ROM exercises</li> <li>d. Electrotherapy</li> <li>e. Parent education</li> <li>F. Home exercise program</li> <li>g. Casting, splinting and orthosis</li> </ul> <p>4. Briefly outline surgical treatment.</p> <p>5. Physical therapy for post-operative cases.</p> <ul style="list-style-type: none"> <li>a. Strengthening exercises</li> <li>b. ROM exercises</li> <li>c. Electrotherapy</li> <li>d. Parent education</li> <li>e. Home exercise program</li> <li>f. Orthosis</li> </ul>
<b>Session 8(Week 18,19, 20)</b>	<p><b>Developmental dysplasia of the hip</b></p> <ul style="list-style-type: none"> <li>1. Define and outline etiology and incidences of DDH.</li> <li>2. Classification: subluxation, dislocatable and dislocated.</li> <li>3. Clinical presentation</li> <li>4. Physical therapy assessment. <ul style="list-style-type: none"> <li>a. Ortolani test.</li> <li>b. Barlow' test.</li> <li>c. Range of Motion</li> <li>d. Gait analysis <ul style="list-style-type: none"> <li>- Unilateral DDH: Trendelenberg gait.</li> <li>- Bilateral DDH: Waddling gait.</li> </ul> </li> </ul> </li> <li>5. Describe Physical therapy management of DDH. <ul style="list-style-type: none"> <li>a. Strengthening exercises</li> <li>b. ROM exercises</li> <li>c. Electrotherapy</li> <li>d. Parent education</li> <li>e. Home exercise program</li> <li>f. Orthosis</li> <li>g. Gait training</li> </ul> </li> </ul>
<b>Session 9(Week 21, 22, 23)</b>	<p><b>Spina bifida</b></p> <ul style="list-style-type: none"> <li>1. Define Spina bifida and outline etiology.</li> <li>2. Outline developmental difficulties and complications.</li> <li>3. Define Hydrocephalus &amp; the chiari II malformation and outline etiology.</li> <li>4. Outline symptoms associated with chiari II malformation.</li> <li>5. Briefly describe surgical management of hydrocephalus: <ul style="list-style-type: none"> <li>ventriculoatrial (VA) shunt &amp;</li> <li>ventriculoperitoneal (VP) shunt.</li> </ul> </li> <li>6. Physical therapy assessment for infant with Spina bifida.</li> </ul>





	<ul style="list-style-type: none"> <li>a. Muscle test: manual muscle testing &amp; functional muscle testing.</li> <li>b. ROM test.</li> </ul> <p>7. Describe Post-operative physical therapy program.</p>
<b>Session 10 (Week 24,25,26)</b>	<p><b>Muscular dystrophy</b></p> <p><b>A. Myotonic dystrophy and Facioscapulohumeral dystrophy:</b></p> <ul style="list-style-type: none"> <li>1. Define and outline etiology.</li> <li>2. Outline modes of inheritance and clinical manifestation.</li> <li>3. Outline physical findings in relation to disabilities progression and prognosis.</li> <li>4. Describe Physical therapy evaluation. <ul style="list-style-type: none"> <li>a. Functional ability.</li> <li>b. Muscle testing.</li> <li>c. ROM testing.</li> </ul> </li> <li>5. Briefly describe medical treatment.</li> <li>6. Describe Physical therapy treatment. <ul style="list-style-type: none"> <li>a. Maximize physical potential</li> <li>b. Maximize respiratory function</li> <li>c. prevent soft tissue shortening</li> <li>d. maximize motor development and milestone</li> <li>e. maintains muscle strength</li> <li>f. improve postural stability</li> <li>g. improve independency</li> <li>h. improve quality of life</li> </ul> </li> </ul> <p><b>B. Duchene muscular dystrophy</b></p> <ul style="list-style-type: none"> <li>1. Define and outline etiology.</li> <li>2. Outline modes of inheritance and clinical manifestation.</li> <li>3. Outline physical findings in relation to disabilities progression and prognosis.</li> <li>4. Describe Physical therapy evaluation. <ul style="list-style-type: none"> <li>a. Functional ability.</li> <li>b. Muscle testing.</li> <li>c. ROM testing.</li> </ul> </li> <li>5. Briefly describe medical treatment.</li> <li>6. Describe Physical therapy treatment. <ul style="list-style-type: none"> <li>a. Prevent deformity.</li> <li>b. Prolonging ambulation.</li> <li>c. Wheelchair use.</li> <li>d. Orthoses.</li> <li>e. Weight control.</li> <li>f. Minimizing spinal deformity.</li> <li>g. Respiratory consideration.</li> <li>h. Activities of daily living.</li> <li>I. Facilitation of family support.</li> <li>j. Facilitating sleep.</li> <li>k. Management of pain.</li> </ul> </li> </ul>
<b>Session 11 (Week 27 &amp; 28)</b>	<p><b>Down's syndrome</b></p> <ul style="list-style-type: none"> <li>1. Define and outline etiology.</li> </ul>





	<p>2. Pathophysiology</p> <p>3. Signs and symptoms</p> <p>4. Associated impairments: neuropathology, sensory deficits, cardiopulmonary pathologies, musculoskeletal differences &amp; additional physical characteristics.</p> <p>5. Physical therapy treatment of D.S</p> <p>a. Balance training b. strengthening exercises</p> <p>c. activities of daily livings d. facilitate family support</p>
<b>Session 12 (Week 29-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>General Surgery &amp; Physiotherapy</b>
2	<b>Course Code</b>	<b>PT303</b>
3	<b>Course type:</b> <b>/general/specialty/optional</b>	specialty
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Principle of Physiotherapy
7	<b>Program offered the course</b>	Physiotherapy Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		This course will contain to section first the Inflammation and infection, common surgical problems, ulcers, shock, burns and management,



	<p>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 catheterization.</p> <p>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.</p> <p>Describe physical therapy program for anal &amp; perianal disorders including: pelvic floor exercises, abdominal exercises, biofeedback and electrical modalities.</p>
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Tidy's physiotherapy, Churchill Livingstone, Stuart Porter, Fourteenth Edition 2011.</li> <li>• surgery &amp; icu, Text book</li> <li>• <a href="http://www.who.int/emergencyburncases/pht/ent">http://www.who.int/emergencyburncases/pht/ent</a></li> <li>• <a href="http://www.icmr.nic/ijmr.com">http://www.icmr.nic/ijmr.com</a></li> <li>• Textbook of Physiotherapy in Surgical Conditions by Mitra P.K.2013 DOI 10.5005/jp/books/11812</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation, practical.
<b>Course Objectives:</b>	<p>Up on completion of the course students should be able to:</p> <ul style="list-style-type: none"> <li>• Know the type of surgery and the name of the injured muscle for each surgery and ways to strengthen it,</li> <li>• Know the type of burn and his physiotherapy,</li> <li>• Distinguish the right conditions and angles for each case,</li> <li>• 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</li> <li>• 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.</li> <li>• Know the potential complications, prognosis of the injuries,</li> <li>• Have detailed knowledge on the post-operative, post-traumatic rehabilitation options and general methods for the different injury types.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %    Attendance 10 %</p> <p>Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Inflammation and infection: <ul style="list-style-type: none"> <li>a. Inflammation.</li> <li>b. Wounds and Wound healing.</li> <li>c. Traumatic wounds.</li> <li>d. Soft-Tissue infection.</li> <li>e. Abscess and cellulitis.</li> </ul>
<b>Session 2 (Week 2)</b>	Common surgical problems: <ul style="list-style-type: none"> <li>a. Tumors.    b. Cysts.</li> </ul>
<b>Session 3 (Week 3)</b>	ULCERS:



	a. Sinus and Fistulas.    b. Gangrene
<b>Session 4 (Week 4)</b>	Shock: Definition, Types, etiology and Management.
<b>Session 5 (Week 5)</b>	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.
<b>Session 6 (Week 6)</b>	General surgery and gastro-intestinal disease: a. Acute Intestinal Obstruction. b. Nephrectomy, Appendectomy, Herniorrhaphy, Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
<b>Session 7 (Week 7)</b>	Describe abdominal surgical incisions
<b>Session 8 (Week 8)</b>	Post- operative complications and management OF: Nephrectomy, Appendectomy, Herniorrhaphy Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
<b>Session 9 (Week 9)</b>	Vascular surgery: a. Varicose veins.    b. The post phlebotic limb.    c. Amputations. d. Deep Vein Thrombosis.
<b>Session 10 (Week 10)</b>	Pulmonary Collapse: a. Pulmonary embolus.    b. Burst abdomen.    c. Post- operative fistula. d. Post- operative pyrexia.
<b>Session 11 (Week 11)</b>	Post- operative fluid and electrolyte imbalance
<b>Session 12 (Week 12)</b>	Urological:    Renal colic.
<b>Session 14 (Week 13)</b>	a. Circumcision.    b. Haematuria
<b>(Week 14)</b>	<b>Midterm Exam</b>
<b>Session 15 (Week 15)</b>	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.
<b>Session 16 (Week 16)</b>	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.
<b>Session 17 (Week 17)</b>	Describe types of splints, their indications, uses, advantages and disadvantages.
<b>Session 18 (Week 18)</b>	List the potential deformities due to burns, methods of prevention and precautions.    Mention cosmetic and functional treatment measures.
<b>Session 19 (Week 19)</b>	Outline the plastic surgery procedures and physiotherapy management in rehabilitation of burns, including splinting methods for common deformities and prevention of burns contractures.
<b>Session 20 (Week 20)</b>	Describe burn patient exercise program including: goals, factors affecting the establishment of exercise program, precautions, contraindications and types of exercise (ROM exercises, conditioning







	exercises, functional exercises and joint mobilization, in addition to specific exercises to specific areas).
<b>Session 21 (Week 21)</b>	Define scar hypertrophy and list its characteristics & possible causes and describe its assessment and treatment.
<b>Session 22 (Week 22)</b>	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).
<b>Session 23 (Week 23)</b>	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.
<b>Session 24 (Week 24)</b>	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, Herniorrhaphy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy and Ileostomy.
<b>Session 25 (Week 25)</b>	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.
<b>Session 26 (Week 26)</b>	Anal and perianal disorders I. Haemorrhoids. - Define and outline etiology, symptoms, classification and types. - Describe management of haemorrhoids including: conservative treatment & surgical treatment.
<b>Session 27 (Week 27,28)</b>	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 acuminata) Describe physical therapy program for anal & perianal disorders including: pelvic floor exercises, abdominal exercises, biofeedback and electrical modalities.
<b>(Week 29-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>1</b>	<b>Course name</b>	<b>Therapeutic Exercise</b>
<b>2</b>	<b>Course Code</b>	<b>PT304</b>
<b>3</b>	<b>Course type: /general/specialty/optional</b>	Specialty
<b>4</b>	<b>Accredited units</b>	3
<b>5</b>	<b>Educational hours</b>	4 hours per week
<b>6</b>	<b>Pre-requisite requirements</b>	Non
<b>7</b>	<b>Program offered the course</b>	Bachelor in Medical Technology Specializing in Physiotherapy
<b>8</b>	<b>Instruction Language</b>	English
<b>9</b>	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		Theories and application methods of comprehensive therapeutic treatment and rehabilitation programs for injuries commonly sustained by the physically active.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• 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:</li> <li>• Lippincott Williams and Wilkins, 2013.</li> <li>• Therapeutic Exercise: Foundations and Techniques</li> <li>• 7th Edition by Carolyn Kisner, Lynn Allen Colby, John Borstad 2018</li> <li>• O'Sullivan, Schmitz, Fulk, Physical Rehabilitation, 6th ed. Philadelphia, Pa: F.A. Davis Company, 2014.</li> <li>• Pruitt, R. Therapeutic Exercise Home Programs.</li> <li>• Kisner and Colby, Therapeutic Exercise Foundations and Techniques, 6th ed. Philadelphia, Pa: FA Davis, 2012.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based presentation, group interaction and discussion, and active participation.
<b>Course Objectives:</b>		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

<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 %      A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topical Coverage</b>
<b>Session 1 (Week 1 &amp; 2)</b>	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
<b>Session 2 (Week 3, 4 &amp; 5)</b>	b) 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)
<b>Session 3 (Week 6,7,8 &amp;9)</b>	c) Body mechanics and postural stabilization I. Body mechanics training II. Postural stabilization activities III. Postural awareness training
<b>Session 4 (Week 10,11 &amp; 12)</b>	d) Flexibility exercises I. Range of motion II. Stretching (eg. Passive, Active, Mechanical)
<b>Session 5 (Week 13 &amp; 14)</b>	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
<b>Session 6 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 7 (Week 16 17&amp; 18)</b>	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
<b>Session 8 (Week 19 20&amp; 21)</b>	<p>F. relaxation Define and describe types &amp; techniques of relaxation.</p> <p>G. Relaxed passive movement Describe classification, principles, indications, goals, limitations, contraindications, precautions and technique of application of passive movement.</p> <p>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.</p>
<b>Session 9 (Week 22, 23&amp; 24)</b>	<p>M. neuromuscular coordination</p> <ol style="list-style-type: none"> <li>1. Define Coordination and Incoordination.</li> <li>2. Describe the following : <ol style="list-style-type: none"> <li>a. Nervous Control.</li> <li>b. Causes of Incoordination.</li> <li>c. Coordination Tests.</li> <li>d. Re – education (principles of reeducation).</li> <li>e. Frenkel's Exercise.</li> </ol> </li> </ol>
<b>Session 10 (Week 25,26, &amp;27)</b>	<p>N. gait Define gait and describe the following :</p> <ol style="list-style-type: none"> <li>a. Gait Cycle (phases of gait cycle and stair gait cycle).</li> <li>b. Gait parameters and determinants of gait.</li> <li>c. Kinetics and Kinematics of the trunk &amp; upper extremities.</li> <li>d. Gait deviations or abnormal gaits (pathological gaits).</li> <li>e. Gait training.</li> </ol> <p>O. MOBILITY AIDS</p> <ol style="list-style-type: none"> <li>1. Wheel Chair : define wheel chair and describe the following: <ol style="list-style-type: none"> <li>a. Types of wheelchairs.</li> <li>b. Considerations for the prescription of appropriate wheelchair.</li> <li>c. Parts of wheelchair.</li> <li>d. Clinical assessment for the prescription of wheelchair.</li> <li>e. Training to use the wheelchair.</li> <li>f. Wheelchair transfers.</li> <li>g. Powered wheelchair.</li> </ol> </li> <li>2. Walking Aids : define walking aids and describe the following: <ol style="list-style-type: none"> <li>a. Crutches : describe the types, measurements, precautions, indications and uses.</li> <li>b. Preparation for crutch walking.</li> <li>c. Crutch walking.</li> <li>d. Sticks and Frames (measurement, types and method).</li> <li>e. Parallel Bar (structure, types and measurement).</li> </ol> </li> </ol>
<b>Session 11 (Week 28 &amp; 29)</b>	<p>P. ORTHOSIS Define Orthosis and describe the following :</p> <ol style="list-style-type: none"> <li>a. Functional and Regional Classification of Orthosis.</li> </ol>





	<p>b. Orthotic Prescription &amp; Management.</p> <p>c. Role of physiotherapist in Orthotic management.</p> <p>d. Physical assessment for the prescription of Orthosis.</p> <p>e. Materials used in the Fabrication of Orthosis.</p> <p>f. Principles of Orthosis.</p> <p>g. Disadvantages of Orthosis.</p> <p>h. Indications for upper and lower limb Orthosis.</p> <p>i. Indications for the prescription of spinal Orthosis.</p> <p>j. Different Types of Spinal Orthosis.</p> <p>Q. RE-Education of muscle</p> <p>1. Describe the following in re-education of muscle: The term re-education of muscle, Technique, Spatial summation, Temporal summation.</p> <p>2. Demonstrate the various re-education techniques and facilitating method on various groups of muscles.</p> <p>3. Demonstrate the progressive exercises in strengthening using various applications: (according to their muscle power) Grade 1 - Grade 5.</p>
<b>Session 12 (Week30-32)</b>	<b>Assessment 4: Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• McPhee, S. J., Papadakis, M. A., &amp; Rabow, M. W. (2014). Current medical diagnosis &amp; treatment 2014. 53rd ed. New York: McGraw-Hill Medical</li> <li>• Differential diagnosis and medical therapeutics:a treatise on clinical by rao,psrk – 2011</li> <li>• EKG   ECG Interpretation Made Easy: An Illustrated Study Guide For Students To Easily Learn How To Read &amp; Interpret ECG Strips</li> <li>• Interpreting ECGs: A Practical Approach Paperback</li> <li>• Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, hospital training....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand various types of medical investigations</li> <li>• Identify type of device used for the health problem</li> <li>• Recognize the status of the patient</li> <li>• Identify representations, terms, conditions, and clinical examination.</li> <li>• Recognize different type of disease</li> <li>• Construct good information about medical device</li> <li>• Write clinical examination for health problem</li> </ul>





	<ul style="list-style-type: none"> <li>• Develop the student skills to choose appropriate patient examination</li> <li>• Implement some medical investigation at hospital</li> <li>• Determine any abnormality.</li> <li>• Understand how to follow up the cases.</li> <li>• Help the physician [DR] in diagnosis and treatment.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• Introduction to medical investigation</li> <li>• Types of medical investigation</li> </ul>
<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li>• Aims of medical investigation</li> </ul>
<b>Session 3 (Week 3)</b>	<ul style="list-style-type: none"> <li>• Classification of medical investigation</li> <li>• Diagnostic test</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Laboratory investigation</li> </ul>
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• Urinalysis</li> </ul>
<b>Session 6 (Week 6)</b>	<ul style="list-style-type: none"> <li>• Methods of collecting urine</li> </ul>
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>• Blood investigation</li> </ul>
<b>Session 7 (Week 8)</b>	<ul style="list-style-type: none"> <li>• Complete blood count, erythrocyte sedimentation rate</li> </ul>
<b>Session 7 (Week 9)</b>	<ul style="list-style-type: none"> <li>• The chemistry panel , blood glucose , FBS indicate</li> </ul>
<b>Session 10 (Week 10)</b>	<b>Midterm Exam</b>
<b>Session 11 (Week 11)</b>	<ul style="list-style-type: none"> <li>• uric acid test, creatinine test, electrolyte test</li> </ul>
<b>Session 12 (Week 12)</b>	<ul style="list-style-type: none"> <li>• liver function test</li> </ul>
<b>Session 13 (Week 13)</b>	<ul style="list-style-type: none"> <li>• blood test</li> </ul>
<b>Session 14 (Week 14)</b>	<ul style="list-style-type: none"> <li>• blood gases test</li> </ul>
<b>Session 15 (Week 15)</b>	<ul style="list-style-type: none"> <li>• cardiovascular system, heart function</li> </ul>
<b>Session 16 (Week 16)</b>	<ul style="list-style-type: none"> <li>• Types of cardiovascular disease and reducing the risk for cv disease</li> </ul>
<b>Session 17(Week 17,18)</b>	Cardiovascular disorders ) and Cytology.
<b>Session 18(Week 19)</b>	Medical investigation of gastrointestinal system.
<b>Session 19(Week 20,21)</b>	Medical investigation of urinary system disorder.
<b>Session 20 (Week 22)</b>	Medical investigation of respiratory system.
<b>Session 21 (Week23,24)</b>	- Medical investigation of central nervous system.
<b>Session 22 (Week25)</b>	Medical investigation of cardiovascular system.
<b>Session 23 (Week26)</b>	Medical investigation of bone diseases
<b>Session 24 (Week27)</b>	Medical imaging.
<b>Session 25 (Week28)</b>	Revision and discussion
<b>Session 26 (Week 29-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Essential of general pharmacology book. Lippincott's Illustrated Reviews: pharmacology book. Pharmacology and drug administration for imaging technology book.</li> <li>• Basic Pharmacology Understanding Drug Actions and Reactions By Maria A. Hernandez,, Appu Rathinavelu, 1<sup>st</sup> edition 2006.</li> <li>• Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> <li>• A Textbook of Clinical Pharmacology and Therapeutics, 5<sup>th</sup> By James Ritter, Lionel Lewis, Timothy Mant, Albert Ferro 2008</li> <li>• Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based. Group interaction and discussion. self-directed activities. Active participation.





<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Acquire new knowledge in pharmacology by conducting and promoting innovative research.</li> <li>• Establish the efficacy, safety and effectiveness of medication in humans, to discover new lead compounds and to understand the mechanisms of action of drugs.</li> <li>• Report the clinical applications, side effects of drugs used in medicine.</li> <li>• Translate pharmacological principles into clinical decision making.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 %    A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<p>A. General pharmacology:</p> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Drug sources.</li> <li>• Routes of drug administration.</li> <li>• Pharmacokinetics.</li> </ul>
<b>Session 2 (Week 2)</b>	<p>A. General pharmacology:</p> <ul style="list-style-type: none"> <li>• Pharmacodynamics.</li> <li>• Drug adverse effects and toxicity.</li> <li>• Drug-drug interactions.</li> </ul>
<b>Session 3 (Week3)</b>	<p>B. Autonomic nervous system:</p> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Sympathomimetics.</li> <li>• Sympathetic depressants.</li> </ul>
<b>Session 4 (Week4)</b>	<p>B. Autonomic nervous system:</p> <ul style="list-style-type: none"> <li>• Parasympathomimetics.</li> <li>• Parasympathetics depressants.</li> </ul>
<b>Session 5 (Week5)</b>	<p>B. Autonomic nervous system:</p> <ul style="list-style-type: none"> <li>• Drug acting on autonomic ganglia.</li> <li>• Skeletal muscle relaxants.</li> <li>• Drug acting on the eye.</li> </ul>
<b>Session 6 (Week 6)</b>	<p>C. Autacoids:</p> <ul style="list-style-type: none"> <li>• Histamine &amp; serotonin.</li> <li>• Prostaglandins &amp; eicosanoids.</li> <li>• Vasoactive peptides.</li> </ul>
<b>Session7 (Week 7)</b>	<p>D. Central nervous system:</p> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Sedative &amp; hypnotics.</li> </ul>
<b>Session8 (Week 8)</b>	<p>D. Central nervous system:</p> <ul style="list-style-type: none"> <li>• Analgesics and antipyretics &amp; NSAID.</li> <li>• Narcotic analgesics.</li> <li>• Anticonvulsants &amp; antiepileptics</li> </ul>
<b>Session9 (Week 9)</b>	<p>D. Central nervous system:</p> <ul style="list-style-type: none"> <li>• Antiparkinsonian drugs.</li> <li>• Antipsychotics and antianxiety &amp; antidepressants.</li> <li>• Local &amp; general Anaesthetic.</li> </ul>





Session10 (Week 10)	E. Cardiovascular system: <ul style="list-style-type: none"> <li>• Antihypertensive &amp; antishock drugs.</li> <li>• Cardiac glycosides and congestive heart failure.</li> <li>• Antiarrhythmic drugs.</li> <li>• Drugs used in angina pectoris.</li> </ul>
Session 11 (Week 11)	Topics to be covered in the session (week12) F. Blood: <ol style="list-style-type: none"> <li>1. Coagulants, anticoagulants, fibrinolytics &amp; antiplatelets.</li> <li>2. Drugs used in treatment of anemia.</li> <li>3. Drugs used in treatment of hyperlipidemia.</li> </ol>
Session 12(Week 12)	G. Chemotherapy: <ul style="list-style-type: none"> <li>• Sulphonamides &amp; quinolones.</li> <li>• B-lactum antibiotics (penicilins, cephalosporins).</li> </ul>
Session 13 (Week 13)	G. Chemotherapy: <ul style="list-style-type: none"> <li>• Chloramphenicol &amp; tetracyclines.</li> <li>• Aminoglucoisides antibiotics.</li> <li>• Antifungal drugs</li> </ul>
Session 14 (Week 14)	<b>Midterm Exam</b>
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: <ul style="list-style-type: none"> <li>• Drug affecting bone mineral homeostasis (pth, vit.D, calcitonin).</li> </ul>
Session 18 (Week 18)	H. Endocrie drugs: <ul style="list-style-type: none"> <li>• Corticosteroids.</li> <li>• Sex hormones, contraceptives drugs.</li> </ul>
Session 19 (Week 19)	I. Respiratory system: <ul style="list-style-type: none"> <li>• Drugs used in treatment of bronchial asthma</li> </ul>
Session 20 (Week 20)	I. Respiratory system: <ul style="list-style-type: none"> <li>• Cough therapy. * Gas therapy</li> </ul>
Session 21(Week 21)	J. GIT: <ul style="list-style-type: none"> <li>• Drugs used in treatment of peptic ulcer</li> <li>• Antiemetic drugs.</li> </ul>
Session22(Week22-23)	J. GIT: <ul style="list-style-type: none"> <li>• Drugs used in treatment of constipation and diarrhea.</li> <li>• Antispasmodics.</li> </ul>
Session23(Week23-28)	K. Urinary tract: 1. Diuretics. 2. Urinary tract infection.
Session24(Week29)	Revision and discussion
Session25(Week 30)	<b>Final exam</b>
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

<b>Brief Description:</b>	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 industrial patient\ The ability to follow up on the patient, modifying and stopping the treatment plan according to the patient's condition.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Therapeutic Exercise_ Foundations and Techniques (2012)</li> <li>• Tidy's physiotherapy, Churchill Livingstone, Fourteenth Edition 201, Stuart Porter.</li> <li>• Muscle Testing. Techniques of manual examination, W.B. Saunders Company, 6<sup>th</sup> Edition, Helen J. Hislop&amp; Jacqueline Montgomery.</li> <li>• Measurement of joint motion, F.A. Davis Company, 4<sup>th</sup> Edition, Cynthia C. Norkin&amp; D. Joyco White.</li> <li>• Additional Resources: Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	6 * 28 = 168 teaching hours
<b>Delivery</b>	Real practice– case study-based presentation, group interaction and discussion, and active participation.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand how to use the right way to make a general assessment and patient evaluation.</li> <li>• Apply the treatment plan to the real patients</li> </ul>



	<ul style="list-style-type: none"> <li>Stand on the right way from any problem that butts the patient in the risk.</li> <li>Identify the problem, disease or disorder the patient has.</li> <li>Construct a series of outcome measures and therapeutic plan</li> <li>Write well developed case report</li> <li>Respect the patient's privacy and preserve confidentiality.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % 10% Attendances 10% Activities 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.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1 &amp; 2)</b>	Stand on the mean units of the physiotherapy department
<b>Session 2 (Week 3)</b>	Describe the general patient practice dealing
<b>Session 3 (Week 4 )</b>	Describe and apply of the general patient practice evaluation
<b>Session 4(Week 5, 6 )</b>	Describe how to apply <b>the general patient practice treatment plan described to the patient</b>
<b>Session 5 (Week 7, 8)</b>	Therapeutic exercise given to low back pain, cervical disc
<b>Session 6 (Week 9, 10)</b>	Pain, core exercise and general exercise for pelvic
<b>Session 7(Week 11, 12 )</b>	Therapeutic exercise for upper limb ( shoulder, elbow, wrist and fingers and metacarpal phalanges joints
<b>Session 8(Week 12,13,14)</b>	Therapeutic exercise for lower limb ( hip, knee and ankle joints
<b>Session 9 (Week 15,16)</b>	passive exercise
<b>Session 10 (Week 17,18)</b>	Active and strengthen exercise
<b>Session 11(Week 19,20 )</b>	Stretching exercise
<b>Session 12(Week 21,22,23 &amp; 24)</b>	Electrotherapy unit
<b>Session 13(Week 25, 26)</b>	Thermotherapy unit
<b>Session 14(Week 27, 28)</b>	Revision, report writing and discussion
<b>Session 15(Week 29, 30)</b>	<b>Final practical exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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 (3<sup>rd</sup> edition). London, UK: TJ International Ltd, Padstow, Cornwall
- 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.





	<ul style="list-style-type: none"> <li>Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications.</li> <li><a href="http://www.pitt.edu/~super7/43011-44001/43911.ppt">http://www.pitt.edu/~super7/43011-44001/43911.ppt</a></li> <li><a href="http://web.tamu-commerce.edu/academics/graduateSchool/">http://web.tamu-commerce.edu/academics/graduateSchool/</a></li> <li>Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor</li> </ul>
<b>Course Duration</b>	2 * 28 = 56 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Upon completing this course, each student will be able to:</p> <ul style="list-style-type: none"> <li>Understand some basic concepts of research and its methodologies and identify appropriate research topics.</li> <li>Demonstrate knowledge of research processes (reading, evaluating, and developing).</li> <li>Perform literature reviews using print and online databases.</li> <li>Understand the formats for citations of print and electronic materials.</li> <li>Identify, explain, compare, and prepare the key elements of a research proposal/report.</li> <li>Compare and contrast quantitative and qualitative research paradigms, and explain the use of each of them.</li> <li>Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in research.</li> <li>Describe sampling methods, measurement scales and instruments, and appropriate uses of each.</li> <li>Explain the rationale for research ethics and importance</li> <li>select and define appropriate research problem and parameters</li> <li>prepare a project proposal (to undertake a project)</li> <li>organize and conduct research (advanced project) in a more appropriate manner</li> <li>Write a research report, thesis and research proposal.</li> <li>Make Critical Appraisal of the Literature</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %      Activity 10 %      Attendance 10 %      Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<p>Introduction to research methodology</p> <ul style="list-style-type: none"> <li>Meaning of Research</li> <li>Definitions of Research</li> <li>Objectives of Research</li> </ul>
<b>Session 2 (Week 2)</b>	<p>Introduction to research methodology</p> <ul style="list-style-type: none"> <li>Motivation in Research</li> <li>General Characteristics of Research</li> <li>Criteria of Good Research</li> </ul>
<b>Session 3 (Week 3)</b>	<p>The Research Problem</p> <ul style="list-style-type: none"> <li>Scientific Thinking</li> <li>What is a Research Problem?</li> <li>Selecting the Problem</li> <li>Sources of the Problem</li> <li>Defining a Problem</li> </ul>





	<ul style="list-style-type: none"> <li>• Statement of a Problem</li> <li>• Delimiting a Problem</li> <li>• Evaluation of a Problem</li> </ul> <p>Assignment 1 handed out</p>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• The Review of Literature <ul style="list-style-type: none"> <li>• Meaning of Review of Literature</li> <li>• Need of Review of Literature</li> <li>• Objectives of Review of Literature</li> <li>• Sources of Literature</li> <li>• The Functions of Literature</li> <li>• How to Conduct the Review of Literature</li> <li>• Some Hints for the Review of Literature</li> <li>• Precautions in Library Use</li> <li>• Reporting the Review of Literature</li> </ul> </li> </ul>
<b>Session 5 (Week 5)</b>	<p>Practice on how to find a literature</p> <ul style="list-style-type: none"> <li>• Selecting a topic</li> <li>• Highlighting the electronic websites that help to better search of literature</li> </ul>
<b>Session 6 (Week 6)</b>	<p>The Research Hypotheses</p> <ul style="list-style-type: none"> <li>• Meaning of Hypothesis</li> <li>• Definitions of Hypothesis</li> <li>• Nature of Hypothesis</li> <li>• Functions of Hypothesis</li> <li>• Importance of Hypothesis</li> <li>• Kinds of Hypothesis</li> <li>• Characteristics of a Good Hypothesis</li> <li>• Variables in a Hypothesis</li> <li>• Formulating a Hypothesis</li> <li>• Testing the Hypothesis</li> </ul> <p>Assignment 2 handed out</p>
<b>Session 7 (Week 7)</b>	<p>The Research Approach</p> <ul style="list-style-type: none"> <li>• The Philosophical Background</li> <li>• The Qualitative Approach</li> <li>• The Quantitative Approach</li> <li>• The Mixed-Methods Approach</li> </ul>
<b>Session 8 (Week 8)</b>	Criteria for Selecting a Research Approach
<b>Session 9 (Week 9)</b>	<p>The Research Designs</p> <ul style="list-style-type: none"> <li>• Meaning of research design</li> <li>• Need for research design</li> <li>• features of a good design</li> </ul>
<b>Session 10 (Week 10)</b>	Review
<b>Session 11 (Week 11)</b>	<p>Assignment of research paper</p> <ul style="list-style-type: none"> <li>• selecting paper</li> <li>• guidelines of reading research paper</li> </ul>
<b>Session 12 (Week 12)</b>	<p>Assignment of research paper</p> <ul style="list-style-type: none"> <li>• Review before submitting the assignment</li> </ul>
<b>Session 13 (Week 13)</b>	Cross-sectional study
<b>Session 14 (Week 14)</b>	Case-control study
<b>Session 15 (Week 15)</b>	Cohort study
<b>Session 16 (Week 16)</b>	<b>Midterm Exam</b>
<b>Session 17 (Week 17)</b>	Experimental study





<b>Session 18 (Week 18)</b>	Criteria for Selecting a Research design
<b>Session 19 (Week 19)</b>	Sampling <ul style="list-style-type: none"> <li>• Meaning and Definition of Sampling</li> <li>• Functions of Population and Sampling</li> <li>• Methods of Sampling</li> <li>• Characteristics of a Good Sample</li> <li>• Size of a Sample</li> </ul>
<b>Session 20 (Week 20)</b>	Data Collection Methods <ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Interviews</li> <li>• Focus Groups</li> <li>• Observation</li> </ul>
<b>Session 21 (Week 21)</b>	Interviewing techniques <ul style="list-style-type: none"> <li>• Face-to-face interview</li> <li>• Telephone interview</li> <li>• Computer based interview</li> </ul>
<b>Session 22 (Week 22)</b>	Data management and analysis <ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• inferential statistics</li> </ul>
<b>Session 23 (Week 23)</b>	Writing research proposal
<b>Session 24 (Week 24)</b>	Writing research report
<b>Session 25 (Week 25)</b>	Critical Appraisal of the Literature
<b>Session 26 (Week 26)</b>	Guidelines for submitting graduation project
<b>Session 27 (Week 27)</b>	Review of research methodology
<b>Session 28 (Week 28)</b>	Revision and discussion
<b>Session 29 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis of Disease 10th Edition - May 18, 2020</li> <li>• Robbins &amp; 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</li> <li>• Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744.</li> <li>• Textbook of pathology by Harsh Mohan 6<sup>th</sup> edition, ISBN: 978-81-8448-702-2, 2010.</li> <li>• <a href="https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf">https://morfopatologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf</a></li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
<b>Course Objectives:</b>		Upon completion of this course, the student will have reliably demonstrated the ability to: <ul style="list-style-type: none"> <li>• Understand the common terms and definitions used in pathology</li> <li>• Identify of the nature of the disease, including its causes, growth patterns, and consequences</li> </ul>



	<ul style="list-style-type: none"> <li>• Recognize the biological characteristics that distinguish each disease from the other.</li> <li>• The ability to distinguish the origin of the disease and how it develops</li> </ul> <p>The ability to distinguish the origin of the disease and how it develops</p> <ul style="list-style-type: none"> <li>• That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment</li> <li>• The student will infer the causes of disease and its growth patterns</li> <li>• The student determines the appropriate diagnostic tools and mechanisms to detect the disease</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• <b>Introduction to pathology</b></li> <li>• Pathology gives explanations of a disease by studying the following four aspects of the disease</li> </ul> <ol style="list-style-type: none"> <li>1. Aetiology</li> <li>2. Pathogenesis</li> <li>3. Morphologic changes</li> <li>4. Functional derangements and clinical significance</li> </ol> <ul style="list-style-type: none"> <li>• The causes of disease</li> </ul> <p>Environmental factors Genetic Factors</p>
<b>Session 2 (Week 2)</b>	<b>Cell injury.</b> - Homeostasis & Cellular adaptation. - Cellular injury and its etiology & pathogenesis. - Hypoxic cell injury ( Reversible & Irreversible cell injury ).
<b>Session 3 (Week 3)</b>	<b>Cell injury.</b> - Free radicals ( sources, effects & destruction of FR ). - Cell injury by chemicals and Cell injury by viruses.
<b>Session 4 (Week 4)</b>	<b>Cell injury.</b> - Cell Aging. - Necrosis, Apoptosis & Gangrene. - Calcification, Pigmentation & Intracellular Accumulations.
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• <b>Inflammation .</b></li> </ul> <ol style="list-style-type: none"> <li>a. Acute inflammation &amp; its types.</li> </ol>
<b>Session 6 (Week 6)</b>	<ol style="list-style-type: none"> <li>b. Chronic inflammation, Granuloma &amp; its types.</li> </ol>
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>• <b>Repair and healing.</b></li> </ul>
<b>Session 8 (Week 8)</b>	<ul style="list-style-type: none"> <li>• <b>Infectious diseases.</b></li> </ul> <ol style="list-style-type: none"> <li>a. Bacterial, Viral, Fungal and Parasitic infection - a general outline</li> <li>b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis &amp; Hydatid disease.</li> </ol>
<b>Session 9 (Week 9)</b>	<ul style="list-style-type: none"> <li>• <b>Immunopathology.</b></li> </ul> <ol style="list-style-type: none"> <li>1. Immune mechanism of tissue injury.             <ol style="list-style-type: none"> <li>a. Type I hypersensitivity.</li> <li>b. Type II hypersensitivity.</li> <li>c. Type III hypersensitivity.</li> <li>d. Type IV hypersensitivity.</li> </ol> </li> </ol>





	e. Tissue transplantation.
<b>Session 10 (Week 10)</b>	2. Autoimmune diseases: a. Systemic Lupus Erythematosus. b. Rheumatoid arthritis. c. Sjogron's Syndrome. d. Systemic Sclerosis (Scleroderma) and Psoriasis.
<b>Session 11(Week 11)</b>	3. Immunodeficiency I.D: Congenital "primary I.D, Acquired "secondary I.D, AIDS - Amyloidosis
<b>Session 12(Week 12)</b>	• <b>Nutrition disorder.</b> Malnutrition, Obesity and Vitamin deficiency disorders.
<b>Session 13 (Week 13)</b>	• <b>Ionizing radiation.</b> a. Sources of radiation. b. Mechanisms of radiation injury. c. Effects of ionizing radiation on cells and tissues.
<b>Session 14(Week 14)</b>	• <b>Hemodynamic disorders</b> Edema, Hyperemia, Congestion, Hemorrhage
<b>Session 15Week 15)</b>	, embolism, thrombosis & Infarction & Shock.
<b>Session 16Week 16)</b>	<b>GENETIC DISORDERS</b> a. Single - Gene Defect "Mendelian Disorders" b. Disorders with Multifactorial Inheritance
<b>Session 17Week 17</b>	c. Cytogenic Disorders "Chromosomal Aberations"
<b>Session18(Week18)</b>	• <b>Neoplasia.</b> - Tumours, Aetiology & spread, common tumours.
<b>Session19(Week19 - 22)</b>	<b>Respiratory diseases.</b> Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
<b>Session20(Week23 - 27)</b>	<b>Cardiovascular diseases .</b> - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
<b>Session 21(Week28 )</b>	<b>Revision and discussion</b>
<b>Session 22(Week29 - 30 )</b>	<b>Final exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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
<b>Course Change</b>	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	<b>Gynecology-obstetric and physiotherapy</b>
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
<b>Brief Description:</b>		<p>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.</p> <p>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.</p>
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Physiotherapy in obstetrics by Maria Ebner third edition 1967.</li> <li>• Physiotherapy in Obstetrics and Gynaecology (Including Education for Childbirth) Helen Heardman 1951</li> <li>• Physiotherapy in Obstetrics and Gynaecology Second Edition by Jill Mantle, Jeanette Haslam and Sue Barton 2004</li> <li>• Textbook of Physiotherapy for Obstetric and Gynecological Conditions by GB Madhuri 2007</li> <li>• Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, practicing exercises.
<b>Course Objectives:</b>		<p>Up on completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Describe and explain anatomical and physiological changes during pregnancy.</li> <li>• Identify and recognize the essentials of gynecology and obstetrics</li> <li>• Able to detect and treat any physical and psychological defect.</li> <li>• Assess physical health and identify any musculoskeletal or neuromuscular problems.</li> <li>• Treat any problem with appropriate physiotherapy skills.</li> <li>• Develop plan of treatment.</li> </ul>






<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session1(Week1)</b>	<ul style="list-style-type: none"> <li>• introduction</li> <li>• Anatomy of female genital tract</li> <li>• Hormonal of female reproductive system</li> <li>• The major maternal physiological adaption to pregnancy</li> <li>• Posture changes during pregnancy.</li> </ul>
<b>Session2(Week2)</b>	<ul style="list-style-type: none"> <li>• Antenatal care</li> <li>• Antenatal education.</li> <li>• Aims of adequate antenatal care.</li> <li>• Psychological preparation for pregnant woman</li> <li>• Medical antenatal care for normal pregnant woman (objectives, frequency of examinations and reassurance &amp; advices).</li> </ul>
<b>Session3(Week3)</b>	<ul style="list-style-type: none"> <li>• Effect of antenatal exercise on mother</li> <li>• Effect o antenatal exercise on fetal wellbeing</li> <li>• Role of the physiotherapists during pregnancy</li> <li>• Warning signs</li> </ul>
<b>Session4(Week4)</b>	<ul style="list-style-type: none"> <li>• Risk pregnancy.</li> <li>• Introduction</li> <li>• Exercises programs for high risk pregnancy.</li> <li>• Pregnancy related hypertension.</li> <li>• Pre-eclampsia</li> <li>• Etiology of pre-eclampsia</li> <li>• Symptoms and signs of pre-eclampsia</li> <li>• Diagnosis of pre-eclampsia</li> <li>• Physical therapy management</li> </ul>
<b>Session5(Week5)</b>	<ul style="list-style-type: none"> <li>• Diabetes and pregnancy. Type of diabetes in pregnancy Screening for diabetes Risk factors for gestational diabetes Diagnosis of diabetes</li> <li>• Effect of diabetes on pregnancy Fetal complication Fetal macrosomia</li> <li>• Management of diabetes in pregnancy</li> <li>• Physical therapy program</li> </ul>
<b>Session6(Week6)</b>	<ul style="list-style-type: none"> <li>• Normal labour Definition Compare between true normal labour and false labour pain Types of vaginal delivery Stages of labour Management of labour</li> <li>• Forceps delivery Definition Risks to patient after use forceps delivery</li> </ul>






	Risks to the baby after use forceps delivery
<b>Session7(Week7)</b>	<ul style="list-style-type: none"> <li>• A vacuum extraction Definition Risks to patient after use A vacuum extraction Risks to the baby after use A vacuum extraction</li> <li>• Episiotomy Introduction Types of episiotomy incisions Uses of episiotomy</li> <li>• Post-partum exercises</li> <li>• Values of exercises</li> </ul>
<b>Session8(Week8)</b>	<ul style="list-style-type: none"> <li>• Normal puerperium Definition Physiological changes Local changes General changes</li> <li>• Management of the puerperium</li> <li>• Postnatal problems</li> <li>• Values of post-partum exercises Prophylactic Curative Lactational</li> <li>• Contraindications postnatal exercises</li> <li>• Massage during labour Back massage Abdominal massage Leg massage</li> </ul> 
<b>Session9(Week9)</b>	<ul style="list-style-type: none"> <li>• Anatomy of the female lower urinary tract.</li> <li>• Functions of the female lower urinary tract.</li> <li>• Affect the pregnancy on lower urinary tract.</li> <li>• Prevention of lower urinary tract during labour.</li> </ul>
<b>Session 10 (Week 10)</b>	<ul style="list-style-type: none"> <li>• Urinary incontinence (UI).</li> <li>• Types of urinary incontinence</li> <li>• Grades of urinary incontinence</li> <li>• Evaluation and treatment of stress urinary incontinence</li> <li>• Physical therapy for pubococcygeus muscle</li> <li>• Physiotherapy for pre and post-operative cases</li> </ul>
<b>Session 11 (week 11)</b>	<ul style="list-style-type: none"> <li>• Displacements of the uterus.</li> <li>• Introduction</li> <li>• Types of displacements of the uterus</li> <li>• Causes of displacement of the uterus</li> <li>• Symptoms of displacement of the uterus</li> <li>• Management of displacement of the uterus</li> <li>• Physical therapy management.</li> <li>• Muscle re-education</li> <li>• Biofeedback (kegel perineometer and EMG biofeedback) Mid-stream urine flow (stop test) Cyriax method</li> </ul>



	<p>Resistive exercise for pubococcygeus muscle An inflated cuffed catheter Vaginal cones</p>
<b>Session 12 (week 12)</b>	<ul style="list-style-type: none"> <li>• Retroversion and retroflexion of the uterus.</li> <li>• Definitions</li> <li>• Varieties of retro-version-flexion</li> <li>• Symptoms of retroversion</li> <li>• Treatment of retroversion</li> <li>• Physical therapy management</li> </ul>
<b>Session13(Week 13)</b>	<ul style="list-style-type: none"> <li>• 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</li> <li>• Values exercises after hysterectomy.</li> </ul>
<b>Session 14 (week 14)</b>	<ul style="list-style-type: none"> <li>• Cesarean section (CS)</li> <li>• Impairments\ problem due to CS</li> <li>• Indications for CS</li> <li>• Complications</li> <li>• Role of physical therapy in CS</li> </ul>
<b>Session 15 (week 15)</b>	<ul style="list-style-type: none"> <li>• Menopause.</li> <li>• Definition</li> <li>• Types of the menopause</li> <li>• Menopause changes</li> <li>• Healthy living</li> <li>• Tips for dealing with hot flushes</li> <li>• Hormone replacement therapy</li> <li>• Management of the menopausal changes</li> </ul>
<b>Session 16 (week 16)</b>	<ul style="list-style-type: none"> <li>• Uses of Electrical modalities in obstetrics.</li> <li>• Electrical modalities during pregnancy.</li> <li>• Electrical modalities during labour.</li> <li>• Electrical modalities during post-natal period.</li> </ul>
<b>Session 17 (week 17)</b>	<p>Uses of Electrical modalities in gynecology.</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• After cesarean section operation Post operation pain relief (C.S, abdominal hysterectomy) Post operation wound healing (C.S, abdominal hysterectomy)</li> </ul>





	Post operation paralytic ileus (C.S, abdominal hysterectomy)
<b>Session 18 (week 18)</b>	Breathing exercises: <ul style="list-style-type: none"> <li>• Respiration</li> <li>• Muscles of Respiration</li> <li>• Anatomy of the diaphragm</li> <li>• General principles for teaching breathing exercises</li> <li>• Diaphragmatic breathing exercises</li> <li>• Costal breathing exercises</li> <li>• Sternal breathing exercises</li> </ul>
<b>Session 19 (week 19)</b>	Pelvic girdle <ul style="list-style-type: none"> <li>• Anatomy of pelvic bone</li> <li>• The joints and ligaments attached</li> <li>• The muscles support for pelvic joint</li> </ul>
<b>Session 20 (week 20)</b>	Pelvic rocking exercises <ul style="list-style-type: none"> <li>• Pelvic rocking exercises</li> <li>• Upward backward "posterior pelvic tilting". From crotch lying position From creeping position From standing position</li> <li>• Downward forward "anterior pelvic tilting". From crotch lying position From creeping position From standing position</li> <li>• Values of pelvic rocking exercises</li> </ul>
<b>Session 21 (week 21)</b>	<ul style="list-style-type: none"> <li>• Polycystic ovarian syndrome (PCOS) Definition Common symptoms Causes of PCOS Pregnancy complication Diagnosis of PCOS Common medical treatment Physiotherapy interventions</li> </ul> 
<b>Session 22 (week 22)</b>	Postural Correction. <ul style="list-style-type: none"> <li>• What is posture?</li> <li>• Good posture</li> <li>• Postural changes during pregnancy</li> <li>• Postural correction from crotch lying position</li> <li>• Postural correction from supine lying position</li> <li>• Postural correction from sitting position</li> <li>• Postural correction from standing position</li> </ul>
<b>Session 23 (week 23)</b>	Positional education: <ul style="list-style-type: none"> <li>• Cross sitting position</li> <li>• Squatting position</li> <li>• Prone kneeling position</li> </ul>
<b>Session 24 (week 24)</b>	Relaxation techniques: <ul style="list-style-type: none"> <li>• Objectives of relaxation training during pregnancy</li> <li>• Principles of relaxation</li> <li>• Mental relaxation</li> <li>• Physical relaxation</li> </ul>



<b>Session 25 (week 25)</b>	Abdominal exercises: <ul style="list-style-type: none"> <li>• Functions of the abdominal muscles</li> <li>• Values of abdominal exercises</li> <li>• Testing the strength of the abdominal muscles</li> <li>• Types of the abdominal exercises</li> </ul> Static abdominal exercises. Dynamic abdominal exercises.
<b>Session 26 (week 26)</b>	Arm exercises: <ul style="list-style-type: none"> <li>• anatomy of Pectoralis major muscle</li> <li>• Types of arm exercises</li> <li>• Values of arm exercises</li> </ul> Circulatory exercises <ul style="list-style-type: none"> <li>• Technique of circulatory exercises</li> <li>• Circulatory exercises for lower limb</li> <li>• Circulatory exercises for upper limb</li> </ul>
<b>Session 27 (week 27)</b>	Varicose veins in pregnancy <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Physical therapy management of varicose veins.</li> <li>• Signs of improvement.</li> <li>• Indications of improvement</li> </ul>
<b>Session 28 (week28)</b>	<ul style="list-style-type: none"> <li>• Legs and feet exercises.</li> <li>• Leg cramps</li> <li>• Treatment</li> <li>• Feet changes during pregnancy</li> <li>• Prevention and treatment</li> </ul>
<b>Session 29 (week29)</b>	Revision and discussion
<b>Week (30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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 students 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

<b>Brief Description:</b>	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
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Essentials of Cardiopulmonary physiotherapy by Ellen Hillegass 3<sup>rd</sup> Edition 2010</li> <li>• Therapeutic Exercise, foundations and techniques by Carolyn Kisner / Lynn Colby 6<sup>th</sup> Edition 2013</li> <li>• General Pathology and Internal Medicine for Physical Therapists by Gabriele Steffers, Susanne Credner 2012</li> <li>• <a href="http://www.heart.org/HEARTORG/Conditions/More/CardiacRehab/Cardiac-Rehab_UCM_002079_SubHomePage.jsp">http://www.heart.org/HEARTORG/Conditions/More/CardiacRehab/Cardiac-Rehab_UCM_002079_SubHomePage.jsp</a></li> <li>• <a href="https://www.bhf.org.uk/heart-health/living-with-a-heart-condition/cardiac-rehabilitation">https://www.bhf.org.uk/heart-health/living-with-a-heart-condition/cardiac-rehabilitation</a></li> <li>• <a href="http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/diagnosing-and-treating/pulmonary-rehabilitation.html">http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/diagnosing-and-treating/pulmonary-rehabilitation.html</a></li> <li>• <a href="https://www.blf.org.uk/support-for-you/exercise/pulmonary-rehabilitation">https://www.blf.org.uk/support-for-you/exercise/pulmonary-rehabilitation</a></li> <li>• Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, and active participation.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the types and mechanisms of breathing technique</li> <li>• Identify patient's condition, problem</li> <li>• Recognize the cardiopulmonary needs of each patient</li> <li>• Construct a series of outcome measures and therapeutic plan</li> <li>• Write well developed case report</li> </ul>






	<ul style="list-style-type: none"> <li>• Respect the patient's privacy and preserve confidentiality</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam        60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topical Coverage</b>
<b>Session1(Week 1)</b>	<ol style="list-style-type: none"> <li><b>Anatomy:</b> 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.</li> <li><b>Assessment</b> Physical assessment in cardio respiratory dysfunction:           <ul style="list-style-type: none"> <li>- <b>Vital signs:</b> temperature, pulse rate, blood pressure and respiratory rate.</li> <li>- <b>Inspection:</b> general appearance ( level of consciousness, body type and extremities evaluation for clubbing, oedema &amp; 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),</li> <li>- <b>Palpation:</b> Tactile and vocal fremitus, mobility of thoracic spine and rib cage.</li> <li>- <b>Percussion:</b> dullness and hyper resonance (percussion of lungs), determination of the upper border of the liver and diaphragmatic excursion.</li> <li>- <b>Auscultation:</b> Normal and abnormal breath sounds (bronchial sounds), vesicular sounds and heart sounds.</li> <li>- <b>Measurement:</b> Chest expansion at different levels (axillary, nipple, xiphoid); exercise tolerance (six minute walking test), Post operative range of motion and muscle assessment.</li> <li>- <b>Investigation:</b> chest x-ray, blood analysis, pulmonary function test and electrocardiography &amp; others.</li> </ul> </li> </ol>
<b>Session2(Week 2)</b>	<b>Physiology:</b> 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.
<b>Session3(Week 3)</b>	<b>Assessment</b> physical assessment in cardio respiratory dysfunction: <b>Vital signs:</b> temperature, pulse rate, blood pressure and respiratory rate. <b>Inspection:</b> 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),





	<p>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),</p> <ul style="list-style-type: none"> <li>- <b>Palpation:</b> Tactile and vocal fremitus, mobility of thoracic spine and rib cage.</li> <li>- <b>Percussion:</b> dullness and hyper resonance (percussion of lungs), determination of the upper border of the liver and diaphragmatic excursion.</li> <li>- <b>Auscultation:</b> Normal and abnormal breath sounds (bronchial sounds), vesicular sounds and heart sounds.</li> <li>- <b>Measurement:</b> Chest expansion at different levels (axillary, nipple, xiphoid); exercise tolerance (six minute walking test), Post operative range of motion and muscle assessment.</li> </ul> <p><b>Investigation:</b> chest x-ray, blood analysis, pulmonary function test and electrocardiography &amp; others.</p>
<p><b>Session 4 (Week 4)</b></p> 	<p>General medical condition</p> <p><b>Hypertension</b></p> <ul style="list-style-type: none"> <li>- define and briefly outline the etiology, clinical features, investigation and management.</li> </ul> <p><b>Hypotension</b></p> <ul style="list-style-type: none"> <li>-define and briefly outline the etiology, clinical features, investigation and management.</li> </ul> <p><b>Metabolic diseases</b></p> <p><b>1- Diabetes mellitus</b></p> <ul style="list-style-type: none"> <li>- define and briefly outline the etiology, clinical features, investigation and management.</li> </ul> <p><b>2- obesity</b></p> <ul style="list-style-type: none"> <li>- define and briefly outline the etiology, clinical features, investigation and management.</li> </ul>
<p><b>Session 5 (Week 5)</b></p>	<p><b>Renal failure</b></p> <ol style="list-style-type: none"> <li>1. Acute Renal Failure: define and briefly outline the etiology, clinical features, investigation and management.</li> <li>2. Chronic Renal Failure: define and briefly outline the etiology, clinical features, investigation and management.</li> </ol> <ul style="list-style-type: none"> <li>- <b>Peptic ulcer disease</b></li> </ul> <ul style="list-style-type: none"> <li>- Briefly outline the etiology, clinical features, investigation and treatment.</li> </ul> <ul style="list-style-type: none"> <li>- <b>Inflammatory bowel disease</b></li> </ul> <ul style="list-style-type: none"> <li>- Briefly outline the etiology, clinical features, investigation and treatment.</li> </ul>
<p><b>Session6(Week6)</b></p>	<p>Indication, principles, precautions, goals &amp; procedure of breathing exercises:</p> <ul style="list-style-type: none"> <li>• Deep breathing exercise</li> <li>• Nose exercise: aims and graduation of nose exercises.</li> <li>• Diaphragmatic breathing, localized basal expansion, apical expansion, specific segmental exercise raising the resting respiratory level.</li> </ul>






	<ul style="list-style-type: none"> <li>• Pursed lip breathing: benefits and graduation of pursed lip breathing.</li> <li>• Localized breathing exercises: upper costal, lower costal, apical and sternal breathing exercises.</li> <li>• Chest mobilization exercises and belt exercise.</li> <li>• Relaxation exercises and positions for the breathless patient – high side lying, forward lean sitting, relaxed sitting, forward lean standing, relaxed standing</li> </ul>
<p><b>Session7 (Week 7)</b></p>	<ul style="list-style-type: none"> <li>* Controlled breathing during walking and during functional activity.</li> <li>* Exercise for the breathless patient: exercise tolerance testing and exercise program.</li> <li>* The technique of huffing and coughing, forced expiratory technique, vibratory chest shaking and percussion.</li> <li>* Technique of Postural drainage, including indications, general precautions and Contra-indications, preparation drainage of individual bronchopulmonary segments, treatment procedure &amp; assessment, modified postural drainage and continuing Postural drainage as a home program.</li> <li>* Massage and stretching techniques, electro and hydrotherapy modalities for cardio respiratory patients</li> </ul>
<p><b>Session8 (Week 8)</b></p>	<ul style="list-style-type: none"> <li>* Outline the history of mechanical respiration, Definition of the following terms             <ul style="list-style-type: none"> <li>a) Respirator b) Lung ventilator c) Resuscitators d) Bird ventilator e) IPPB f) PEEP g) CPAP h) SIMV i) PEEP.</li> </ul> </li> <li>Classification of ventilators by third cycling control (volume cycling, pressure cycling, time cycling and mixed cycling).</li> <li>* The principles of operation of commonly used ventilators and outline the use of the following types: i) Bear ii) Bennett iii) Emerson iv) Bird.</li> </ul>
<p><b>Session9 (Week 9)</b></p>	<p>Outline the principles of Aerosol Therapy.</p> <ul style="list-style-type: none"> <li>• Description of the physical properties of aerosol and their deposition in the alveoli</li> <li>• Description of the principles of nebulizers.</li> <li>• Outline the principles of humidification therapy and methods of correcting humidity deficits.</li> <li>• Description of the principles of operation of pass - over humidifiers and bubble – diffusion humidifiers.</li> <li>• Description of the techniques of sterile nasopharyngeal and endotracheal suctioning.</li> </ul>
<p><b>Session10 (Week10)</b></p>	<p><b>Respiratory tract infection</b></p> <p><b>Chronic obstructive lung/pulmonary diseases</b></p> <ul style="list-style-type: none"> <li>- Characteristics of patients with obstructive lung disease</li> <li>- General clinical problems.</li> <li>- General physiotherapy intervention for COPD</li> <li>- Guidelines for exercise prescription for patients with COPD.</li> </ul> <p><b>a- Chronic bronchitis</b></p> <ul style="list-style-type: none"> <li>- Symptoms, Causes, Diagnosis and Treatment</li> </ul>





<p><b>Session11 (Week11)</b></p>	<p><b>b- Emphysema</b> Symptoms, Causes, Diagnosis and Treatment -</p> <ul style="list-style-type: none"> <li>➤ Clinical problem of chronic bronchitis and emphysema</li> <li>➤ Treatment goal and therapeutic plan for chronic bronchitis and emphysema</li> </ul> <p><b>c- Bronchiectasis</b> Symptoms, Causes, Diagnosis and Treatment -</p> <ul style="list-style-type: none"> <li>➤ Clinical problem of bronchiectasis</li> </ul> <p>Treatment goal and therapeutic plan for bronchiectasis</p>
<p><b>Session12 (Week12)</b></p>	<p><b>d- Cystic fibrosis</b> Symptoms, Causes, Diagnosis and Treatment -</p> <ul style="list-style-type: none"> <li>➤ Clinical problem of cystic fibrosis</li> <li>➤ Treatment goal and therapeutic plan for cystic fibrosis</li> </ul> <p><b>e- Asthma</b> - types of asthma Symptoms, Causes, Diagnosis and Treatment -</p> <ul style="list-style-type: none"> <li>➤ Clinical problem of asthma</li> </ul> <p>Treatment goal and therapeutic plan for asthma</p>
<p><b>Session 13 (Week 13)</b></p>	<p><b>Restrictive lung/pulmonary diseases</b></p> <ul style="list-style-type: none"> <li>- Pulmonary and extra pulmonary causes of restrictive lung disease</li> <li>- General clinical problems.</li> <li>- General physiotherapy intervention for RLD</li> <li>- Guidelines for exercise prescription for patients with RLD.</li> </ul> <p><b>a- Lung cancer</b></p> <ul style="list-style-type: none"> <li>- Stages of lung cancer</li> <li>- Symptoms, causes, diagnosis and treatment</li> </ul>
<p><b>Session 14 (Week 14)</b></p>	<p><b>b- Pneumonia</b></p> <ul style="list-style-type: none"> <li>- Classification</li> <li>- Signs and Symptoms</li> <li>- Complication, diagnosis, treatment</li> <li>➤ Clinical problem of chronic pneumonia</li> <li>➤ Treatment goal and therapeutic plan for pneumonia</li> </ul> <p><b>c- Tuberculosis</b></p> <ul style="list-style-type: none"> <li>- Signs and Symptoms</li> <li>- Complication, diagnosis, treatment</li> <li>➤ Clinical problem of tuberculosis</li> <li>➤ Treatment goal and therapeutic plan for tuberculosis</li> </ul>
<p><b>Session 15 (Week 15)</b></p>	<p><b>d- Atelectasis</b></p> <ul style="list-style-type: none"> <li>- Signs and Symptoms</li> <li>- Causes of obstructive and non obstructive atelectasis</li> <li>- Diagnosis</li> <li>- Treatment</li> </ul> <p><b>e- Pleural disease</b> <b>Dry pleurisy</b></p>



	<ul style="list-style-type: none"> <li>- Symptoms, causes , diagnosis and treatment</li> <li><b>Pleural effusion</b></li> <li>- Etiology</li> <li>- Symptoms, causes, diagnosis and treatment</li> <li><b>f- Empyema</b></li> <li>- Etiology</li> <li>- Symptoms, causes , diagnosis and treatment</li> </ul>
<b>Session 16(Week 16)</b>	<ul style="list-style-type: none"> <li>➤ <b>pulmonary surgery</b></li> <li>- Indication and Types of surgery</li> <li>- Types of incision</li> <li>- Pre operative physiotherapy preparation</li> <li>- Post operative problem list</li> <li>- Post operative therapeutic goals</li> <li>- Post operative therapeutic plan</li> <li>➤ <b>pulmonary rehabilitation</b></li> <li>- Exercise regimen</li> <li>- Breathing exercises</li> <li>- Long term home program</li> <li>- Improve quality of life</li> </ul> 
<b>Session 17 (Week 17)</b>	<b>Midterm Exam</b>
<b>Session 18 (Week 18-20)</b>	<p>Congenital heart defects</p> <ul style="list-style-type: none"> <li>➤ Acyanotic Congenital Heart</li> <li>1- Patent Ductus Arteriosus PDA <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms and diagnosis, treatment</li> </ul> </li> <li>2- Atrial Septal Defects ASD <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms and diagnosis, treatment</li> </ul> </li> </ul>
<b>Session 19 (Week 19)</b>	<ul style="list-style-type: none"> <li>3- Ventricular Septal Defects VSD <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms and diagnosis, treatment</li> </ul> </li> <li>4- Atrioventricular Septal Defects AVSD <ul style="list-style-type: none"> <li>- Characteristics</li> </ul> </li> </ul> <p>Signs, symptoms and diagnosis, treatment</p>
<b>Session20(Week 20)</b>	<ul style="list-style-type: none"> <li>➤ Cyanotic Congenital Heart</li> <li>1- Tetralogy of Fallot <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms, diagnosis and treatment</li> </ul> </li> <li>2- Transposition of the great arteries <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms, diagnosis and treatment</li> </ul> </li> <li>3- Double-outlet right ventricle (DORV) <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms, diagnosis and treatment</li> </ul> </li> <li>4- Hypoplastic Left Heart Syndrome HLHS <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Signs, symptoms, diagnosis and treatment</li> </ul> </li> </ul>



<b>Session21(Week 21)</b>	<ul style="list-style-type: none"> <li>➤ Cardiac surgery <ul style="list-style-type: none"> <li>- Types of approaches</li> <li>1- Open heart surgery <ul style="list-style-type: none"> <li>- Indications</li> </ul> </li> <li>2- Closed heart surgery <ul style="list-style-type: none"> <li>- Indications</li> </ul> </li> </ul> </li> <li>➤ Aims of physiotherapy following cardiac surgery</li> <li>➤ Pre-operative training</li> <li>➤ Post-operative physiotherapy management</li> <li>➤ Complications following cardiothoracic surgery <ul style="list-style-type: none"> <li>Factors that increase the postoperative complications</li> </ul> </li> </ul>
<b>Session22(Week 22)</b>	<ul style="list-style-type: none"> <li>- Complications following cardiothoracic surgery <ul style="list-style-type: none"> <li>a- Respiratory problems/ Physiotherapy for the respiratory complications</li> <li>b- Cardiac complications/ Physiotherapy for the cardiac complications</li> <li>c- Deep venous thrombosis/ Physiotherapy to prevent DVT or dealing with DVT</li> </ul> </li> <li>Wound infection/ Physiotherapy for healing and scar management</li> </ul>
<b>Session 23 (Week 23)</b>	<ul style="list-style-type: none"> <li>➤ <b>Heart failure</b> <ul style="list-style-type: none"> <li>- Definition</li> <li>- Manifestations of right side heart failure</li> <li>- Manifestations of Left side heart failure</li> <li>- Causes, Signs, symptoms, diagnosis and treatment</li> </ul> </li> </ul>
<b>Session 24 (Week 24)</b>	<ul style="list-style-type: none"> <li>➤ <b>Ischemic heart disease</b> <ul style="list-style-type: none"> <li>- Predisposing factors</li> <li>- Pathogenesis</li> <li>- Clinical feature <ul style="list-style-type: none"> <li>a- Mild degree (angina pectoris)</li> <li>b- Angina at rest</li> <li>c- Unstable angina</li> <li>d- Acute myocardial infarction (acute M.I.)</li> </ul> </li> <li>- Investigations and Treatment</li> </ul> </li> <li>➤ <b>Myocardial infarction</b> <ul style="list-style-type: none"> <li>- Definition</li> <li>- Causes, Pathophysiology, Clinical feature and Diagnosis</li> </ul> </li> <li>➤ <b>Cardiac rehabilitation</b></li> </ul>
<b>Session 25 (Week 25)</b>	<ul style="list-style-type: none"> <li>- <b>Phases of cardiac rehabilitation</b> <ul style="list-style-type: none"> <li><b>a- Phase I (Immediate inpatient phase)</b> <ul style="list-style-type: none"> <li>- The goals of rehabilitation during Phase I</li> <li>- Therapeutic plan during phase I</li> <li>- Termination criteria of phase I Exercise Session</li> </ul> </li> <li><b>b- Phase II</b> <ul style="list-style-type: none"> <li>- The goals of rehabilitation during Phase II</li> </ul> </li> </ul> </li> </ul>





	<ul style="list-style-type: none"> <li>- Training Program <ul style="list-style-type: none"> <li>a- Specific monitoring prior each session of phase II</li> <li>b- Conditioning exercises</li> <li>c- Free exercises</li> <li>d-Return to work after phase II</li> </ul> </li> <li>c- <b>Phase III (home program)</b></li> <li>- The goals of rehabilitation during Phase III</li> </ul> <p>Suggestions for Exercising At Home</p>
<b>Session 26 (Week 26)</b>	<ul style="list-style-type: none"> <li>➤ <b>Principles of intensive care therapy.</b></li> <li>a- <b>ICU equipment's:</b> 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.</li> </ul>
<b>Session 27 (Week 27)</b>	<p><b>Assessment:</b> 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.</p> <p><b>Handing techniques</b> Turning, tilting, incision support, bedside mobility, stander, walker</p>
<b>Session 12 (Week 28 )</b>	<ul style="list-style-type: none"> <li>➤ Geriatric care rehabilitation</li> <li>- Life history</li> <li>- The Ageing Body: Theories of Ageing (Physiological &amp; Environmental)</li> <li>- Locomotor System</li> <li>- Cardio-Respiratory System</li> <li>- Neurological Function</li> <li>- Autonomic Function</li> <li>- Metabolic Changes</li> <li>- Mental Function</li> <li>- Approach to the treatment: Interview, Examination and Aims of Intervention</li> <li>- Role of the Physiotherapist</li> <li>- Home based rehabilitation program</li> </ul>
<b>Session 13 (Week 29 )</b>	Revision and discussion
<b>(Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>Rehabilitation of injuries and neurological diseases</b>
2	<b>Course Code</b>	PT403
3	<b>Course type: /general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Principle of Physiotherapy
7	<b>Program offered the course</b>	Bachelor in Medical Technology Specializing in Physiotherapy
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
	<b>Brief Description:</b>	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.
	<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• The Clinical Science of Neurologic Rehabilitation, OXFORD UNIVERSITY PRESS, Second edition, BRUCE H. DOBKIN, M.D.</li> <li>• Pathophysiology made incredibly easy, Lippincott Williams &amp; Wilkins, 4<sup>th</sup> edition, Elizabeth Rosto</li> <li>• Principles of Anatomy and physiology, John Wiley &amp; Sons, Inc, 12<sup>th</sup> edition, Gerard J. Tortora, Bryan Derrickson.</li> <li>• A Massage Therapist's Guide to Pathology, Lippincott Williams &amp; Wilkins, 4<sup>th</sup> edition, Ruth Werner.</li> <li>• Case Studies in Neurological Rehabilitation, CAMBRIDGE UNIVERSITY PRESS, First edition, Tarek A.-Z. K. Gaber</li> <li>• Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the in addition to hand out</li> </ul>
	<b>Course Duration</b>	4 * 28 = 112 teaching hours
	<b>Delivery</b>	Lecture-based presentation, group interaction and discussion, and active participation.







<b>Course Objectives:</b>	<p>Upon completion of this course, the student should be able to:</p> <ul style="list-style-type: none"> <li>• Understand the normal anatomy and physiology of the nervous system.</li> <li>• Understand the specific features of the CNS &amp; PNS.</li> <li>• Understand the specific features of the central nervous system and the peripheral nervous system during and after injury.</li> <li>• Study and know diseases that affect the nervous system.</li> <li>• Identify the problem, disease or disorder of the nervous system the patient has.</li> <li>• Recognize the motor and/or functional needs of each case.</li> <li>• Construct a series of outcome measures and therapeutic plan.</li> <li>• Write well developed case report.</li> <li>• Respect the patient's privacy and preserve confidentiality.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activities 10%          Attendances 10%    Final Exam 60 %          A 60 % is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1- 3)</b>	<p>1. Neuroanatomy and neurophysiology of the Central and peripheral nervous system.          2. Neuroanatomy: Blood supply</p>
<b>Session 2 (Week 4)</b>	Myotome & dermatome
<b>Session 3 (Week 5)</b>	Hypertonia
<b>Session 4 (Week 6)</b>	Dyskinesia
<b>Session 5 (Week 7 - 8)</b>	Cerebellar disorders
<b>Session 7 (Week 9- 10)</b>	Upper motor neuron pathologies: CVA, TBI, MS, PD, SCI, MND
<b>Session 8 (Week 11-12)</b>	Lower motor neuron pathologies: GBS, Bell's palsy, TN, Muscular dystrophy
<b>Session 9 (Week 13- 14)</b>	Injuries to the peripheral nerves (Neuropathy)
<b>Session 6 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 10 (Week 16)</b>	Evidence-based practice
<b>Session 10 (Week 17 )</b>	Assessment of neurological conditions
<b>Session 10 (Week 18 )</b>	Spasticity management
<b>Session10(Week19-20 )</b>	Common interventions for neurological disorders
<b>Session10(Week 21-22 )</b>	Stretching & Strengthening Proprioceptive neuromuscular facilitation
<b>Session10(Week23- 24 )</b>	Task-repetitive (oriented training) Reaching & Grasping training
<b>Session10(Week25-26 )</b>	Sit-To-Stand training Trunk mobilization
<b>Session11(Week 27- 28)</b>	Gait training Balance & Coordination Somatosensory training (Proprioception & Vision)
<b>(Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>Orthopedics and physical therapy</b>
2	<b>Course Code</b>	PT404
3	<b>Course type: /general/specialty/optional</b>	Specialty
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Principle of Physiotherapy
7	<b>Program offered the course</b>	Physiotherapy Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	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



	<ul style="list-style-type: none"> <li>• Orthopaedic Physical Therapy by Robert Donatelli, Michael Wooden 4th Edition - July 27, 2009</li> <li>• Orthopedic Physical Assessment 3. Maitland's Peripheral Manipulation</li> <li>• Physiotherapy in Orthopaedics A Problem-Solving Approach by Karen Atkinson, Fiona Coutts, Anne-Marie Hassenkamp 2nd Edition - March 22, 2005</li> <li>• Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the in addition to hand out</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, and active participation.
<b>Course Objectives:</b>	<p>Upon completion of the course the students should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate ability of writing Subjective and Objective parts of the SOAP note for musculoskeletal condition.</li> <li>• Conduct appropriate subjective examination musculoskeletal condition of upper and lower extremities</li> <li>• Define basic terminology related to musculoskeletal disorders</li> <li>• Differentiate between signs and symptoms of various bones and muscles disorders</li> <li>• Demonstrate a critical understanding of the impact of diseases of muscles and bones on human function</li> <li>• Describe the causes and mechanism of bone and soft tissue disorders, injuries, and the mechanism of recovery .</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activities 10%          Attendances 10%    Final Exam 60 %          A 60 % is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topical Coverage</b>
<b>Session 1 (Week 1-3)</b>	<p>A . Introduction to Orthopaedics          Introduction to orthopedic terminology, types of pathology commonly dealt with, clinical examination, common investigations and outline of non - operative &amp; management.</p>
<b>Session 2 (Week 4-5)</b>	<p>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.</p>
<b>Session 3 (Week 6- 9)</b>	<p>D. FRACTURES &amp; DISLOCATIONS: General Principles outline the following:          1. Types of Fractures including patterns, open and closed fractures and fracture – dislocations.          2. Difference between dislocation &amp; subluxation.          3. General &amp; Local signs &amp; symptoms of fractures, dislocations.</p>







	<p>4. Principles of management of fractures, dislocations.</p> <p>5. Prevention &amp; treatment of complications including: Fracture, Volkmann's ischemic contracture, Sudek's Atrophy, Carpal Tunnel syndrome, Myositis-ossificans, and shoulder - hand syndrome.</p> <p>6. Fracture healing. .</p>
<b>Session4(Week10-12)</b>	<p>E. UPPER LIMB FRACTURES &amp; DISLOCATIONS</p> <p>1. Enumerate major long bone fractures and joint injuries.</p> <p>2. Briefly describe their clinical features, principles of management and complications.</p> <p>F. LOWER LIMB FRACTURES &amp; DISLOCATIONS</p> <p>1. Enumerate major long bone fractures and joint injuries.</p> <p>2. Briefly describe their clinical features, principles of management and complications.</p>
<b>Session5(Week13-15)</b>	<p>G. SPINAL FRACTURES AND DISLOCATIONS</p> <p>Outline the mechanism, clinical features, and principles of management and complications of spinal injuries.</p> <p>H. RECURRENT DISLOCATIONS</p> <p>Outline the mechanism, clinical features principles of management and complications of recurrent dislocation of the shoulder and patella.</p>
<b>Session6(Week16-17)</b>	<p>I. PEDIATRIC SURGERY</p> <p>1. The child who limps. 2. Child with fractures.</p> <p>J. AMPUTATIONS.</p> <p>1. Classify amputations, list indication for surgery.</p> <p>2. Outline pre - operative, operative and prosthetic management.</p> <p>3. Outline prevention and treatment of complications.</p>
<b>Session 7 (Week 18)</b>	<b>Midterm Exam</b>
<b>Session8(Week19-20)</b>	<p>K. BONE &amp; JOINT INFECTIONS</p> <p>Outline the etiology, clinical features, management and complications of: septic arthritis, osteitis, osteomyelitis, Tuberculosis (including spinal T.B)</p> <p>L. BONE &amp; JOINT TUMORS</p> <ul style="list-style-type: none"> <li>- 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</li> </ul>
<b>Session9(Week21-23)</b>	<p>M. CHRONIC ARTHRITIS</p> <p>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 &amp; spasmodic torticollis</p> <p>Outline the above including clinical features and management.</p>
<b>Session10(Week24- 26)</b>	<p>O. Spinal deformities</p> <p>Classify spinal deformities and outline the salient clinical features, management and complications.</p>



	<p><b>P. POLIOMYELITIS</b> 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.</p>
<b>Session 11 (Week 27)</b>	<p><b>Q. CONGENITAL DEFORMITIES</b> 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, Arthrogryposis multiplex congenita, poly dact, osteogenesis imperfecta).</p> <p><b>R. PERIPHERAL NERVE INJURIES</b> Outline the clinical features and management, including reconstructive surgery of:</p> <ol style="list-style-type: none"> <li>1. Radial, median and ulnar nerve lesions.</li> <li>2. Sciatic and lateral popliteal nerve lesions.</li> <li>3. Brachial Plexus injuries including Erbs Palsy Klumpke's Paralysis, crutch palsy.</li> </ol>
<b>Session 12 (Week 28&amp;29)</b>	<p><b>S. HAND INJURIES</b> Outline clinical features, management and complications of: Skin and soft tissue injury, Tendon injury, Bone and joint injury.</p> <p><b>T. LEPROSY</b> Outline clinical features, management and complications of neuritis, muscle paralysis, tropic ulcer of hand &amp; feet deformities.</p>
<b>Session 12 (Week 30)</b>	Revision and discussion
<b>(Week 31-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Tidy's physiotherapy, Churchill Livingstone, Stuart Porter, Fourteenth Edition 2011.</li> <li>• Sports Injuries Prevention, Treatment and Rehabilitation, Fourth Edition By Lars Peterson, Lars Peterson, Per A.F.H. Renstrom 4<sup>th</sup> edition 2016</li> <li>• Rehabilitation of sports injuries: scientific basis Reviewed by Jack Edward Taunton 2003</li> <li>• Sports Injury Prevention and Rehabilitation Integrating Medicine and Science for Performance Solutions Edited By David Joyce, Daniel Lewindon 2015</li> <li>• Principle of physical therapy, Peter G. Tsarfia, M.D, Grune Stratton.</li> <li>• Complete reflexology ( therapeutic foot message for health and will-being ), Mustard 1999 Designed by The Bridgewater book company.</li> <li>• Additional Resources: articles, Additional textbooks, handouts, and web links may be used in this course at the in addition to hand out</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation, practical.
<b>Course Objectives:</b>	<ul style="list-style-type: none"> <li>• Upon completion of this course, the student will have reliably demonstrated the ability to:</li> <li>• Use and apply each principle of physical therapy individually or all with the priority of one principle over the other.</li> </ul>







	<ul style="list-style-type: none"> <li>• 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</li> <li>• Apply the basic principles of physiotherapy towards the patient in practice.</li> <li>• Collect patient information and use it to plan for the patient.</li> <li>• Stop one starter and replace it with another when necessary. Dr. General and Transferred Skills</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activities 10% Attendances 10%    Final Exam 60 % A 60 % is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Physiologic Factors in Rehabilitation
<b>Session 2 (Week 2)</b>	Reaction to injury
<b>Session 3 (Week 3)</b>	Response of Joint Structures to Injury
<b>Session 4 (Week 4)</b>	Effects of immobilization on the muscles, joints, ligaments and connective tissue
<b>Session 5 (Week 5 )</b>	Continuous passive motion
<b>Session 6 (Week 6 &amp; 7)</b>	Effects of remobilization on the muscles, joints
<b>Session 8 (Week 9&amp; 10)</b>	Effects of remobilization on ligaments and connective tissue
<b>Session 9 (Week 11&amp; 12)</b>	Static and dynamic flexibility
<b>Session 10 (Week 13)</b>	Peripheral Receptor Afferent Activity
<b>(Week 14)</b>	<b>Midterm Exam</b>
<b>Session 11 (Week 15)</b>	Applying Principles of Motor
<b>Session 12 (Week 16)</b>	Basic Strategies for Implementing
<b>Session 13 (Week 17)</b>	Types of therapeutic exercise
<b>Session 14 (Week 18)</b>	Therapeutic Exercise for Neuromuscular Strength/Endurance
<b>Session 15 (Week 19)</b>	Static and dynamic exercises
<b>Session 16 (Week 20)</b>	concentric and eccentric contraction exercise
<b>Session 17 (Week 21)</b>	Chronic Degenerative Injuries
<b>Session 18 (Week 22)</b>	Chronic Degenerative Injuries
<b>Session 19 (Week 23)</b>	Isotonic Exercise, Resistance Exercise
<b>Session 20 (Week 24)</b>	Isotonic Exercise, Resistance Exercise
<b>Session 21 (Week 25)</b>	Modalities for acute care
<b>Session 22 (Week 28)</b>	Exercise in rehabilitation
<b>Session 23 (Week 29)</b>	Revision and discussion
<b>(Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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.
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### 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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• physiotherapy in obstetrics by Maria Ebner third edition.</li> <li>• Electrophysical Agents Evidence-based Practice by Tim Watson, Ethne Nussbaum 13th Edition - March 17, 2020</li> <li>• Hydrotherapy A Brief Summary of the Practical Value of Water in Disease for Students and Practicians of Medicine by William; H. Dieffenbach</li> <li>• Textbook of Electrotherapy by Jagmohan Singh DOI 10.5005/jp/books/11673</li> <li>• Clayton's Electrotherapy And Actinotherapy: Including The Physics Of Movement And Hydrotherapy Pauline M. Scott 1980</li> <li>• Additional textbooks, handouts, and weblinks may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, practicing exercises.







<b>Course Objectives:</b>	<p>Up on completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Describe and explain anatomical and physiological changes during pregnancy.</li> <li>• Identify and recognize the essentials of gynecology and obstetrics</li> <li>• Detect and treat any physical and psychological defect.</li> <li>• Assess physical health and identify any musculoskeletal or neuromuscular problems.</li> <li>• Treat any problem with appropriate physiotherapy skills.</li> <li>• Develop plan of treatment.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activities 10%          Attendances 10%    Final Exam 60 %          A 60 % is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session1(Week1)</b>	Basic components of electric current – electrons, protons, neutrons, ions, matter, molecules
<b>Session2(Week2)</b>	Current electricity – static electricity
<b>Session3(Week3)</b>	electric charge, conductors, Insulation, unit of electric current
<b>Session4(Week4)</b>	Conduction of electricity
<b>Session5(Week5)</b>	Resistance, factors effecting resistance with example in human body
<b>Session6(Week6)</b>	Ultrasonic therapy- properties of ultrasonic field
<b>Session7(Week7)</b>	Application of Microwave Diathermy
<b>Session8(Week8)</b>	therapeutic effects of Microwave Diathermy
<b>Session9(Week9)</b>	<b>Midterm exam</b>
<b>Session 10 (Week 10)</b>	Infra-red: physiological effects and treatment procedure
<b>Session 11 (week 11)</b>	Infra-red: evaluation of therapeutic effects
<b>Session 12 (week 12)</b>	Paraffin wax & moist heat: effects and indications
<b>Session13(Week 13)</b>	Paraffin wax & moist heat: Principal, technique, and methods of application
<b>Session 14 (week 14)</b>	Cryotherapy: physiological effects and methods
<b>Session 15 (week 15)</b>	Cryotherapy: Preparation and techniques of application
<b>Session 16 (week 16)</b>	Hydrotherapy: basic principal of hydrotherapy
<b>Session 17 (week 17)</b>	Hydrotherapy: techniques of application
<b>Session 18 (week 18)</b>	Clinical application of hydrotherapy on osteoarthritis
<b>Session 19 (week 19)</b>	Clinical application of hydrotherapy on hemiplegia
<b>Session 20 (week 20)</b>	Evaluation of the therapeutic effects of hydrotherapy
<b>Session 21 (week 21)</b>	Application of ultraviolet radiation
<b>Session 22 (week 22)</b>	Assessment of therapeutic effects of infra-red and UV radiation
<b>Session 23 (week 23)</b>	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)	<b>Final Exam</b>
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 on going 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. 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



	<p>\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 industrial 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</p>
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Therapeutic Exercise_ Foundations and Techniques (2012)</li> <li>• Tidy's physiotherapy, Churchill Livingstone, Fourteenth Edition 201, Stuart Porter.</li> <li>• Muscle Testing. Techniques of manual examination, W.B. Saunders Company, 6<sup>th</sup> Edition, Helen J. Hislop&amp; Jacqueline Montgomery.</li> <li>• Measurement of joint motion, F.A. Davis Company, 4<sup>th</sup> Edition, Cynthia C. Norkin&amp; D. Joyco White.</li> <li>• Journal of Physical Therapy</li> <li>• Additional textbooks, handouts, and weblinks may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	6 * 28 = 168 teaching hours
<b>Delivery</b>	Real practice– case study-based presentation, group interaction and discussion,and active participation.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand how to use the right way to make a general assessment and patient evaluation.</li> <li>• Apply the treatment plan to the real patients</li> <li>• Stand on the right way from any problem that puts the patient in the risk.</li> <li>• Identify the problem, disease or disorder the patient has</li> <li>• Construct a series of outcome measures and therapeutic plan</li> <li>• Write well developed case report</li> <li>• Respect the patient's privacy and preserve confidentiality.</li> </ul>
<b>Course Assessments</b>	<p>20% homework &amp; assignment / presentation/ case report  20% case study  60% final practical exam and practical  A 60 % is required for a pass in this course.  Homework &amp; 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.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1- 3)</b>	1- Treatment plan making





	<ul style="list-style-type: none"> <li>2- How to follow up the treatment plan</li> <li>3- How to change treatment plan</li> </ul>
<b>Session 2 (Week 4 -7 )</b>	1- Describe how to apply the general patient practice treatment plan described to the patient
<b>Session 3 (Week 7 -11 )</b>	<ul style="list-style-type: none"> <li>1- Therapeutic exercise given to neuro-defect patients <ul style="list-style-type: none"> <li>a- Hypertonic and spasticity exercise</li> <li>b- CVA</li> <li>c- GBS</li> </ul> </li> </ul>
<b>Session 4 (Week 11-13)</b>	<ul style="list-style-type: none"> <li>a- MS</li> <li>b- PSD</li> <li>c- TBI</li> </ul>
<b>Session 5 (Week 14 - 17)</b>	<ul style="list-style-type: none"> <li>a- Amyotrophic lateral sclerosis</li> <li>b- Spinal cord injuries</li> <li>c- Cerebral palsy</li> </ul>
<b>Session 6 (Week 18-19 )</b>	passive exercise, Active and strengthen exercise and Stretching exercise
<b>Session7(Week20-22)</b>	Respiratory physiotherapy and chest exercise
<b>Session 8 (Week23-25 )</b>	Uren system physiotherapy
<b>Session9(Week26-27)</b>	Buren and surgery physiotherapy
<b>Session 10 (Week 28)</b>	hydrotherapy unit and Thermotherapy unit
<b>Session 11 (Week 29)</b>	Revision and discussion
<b>Session 12 (Week 30)</b>	<b>Final practical exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>Brief Description:</b>	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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Essentials of Human Anatomy &amp; Physiology by Elaine Marieb 10th Edition or later (recommended).</li> <li>• Human Anatomy &amp; Physiology, Books a la Carte Edition 10th Edition by Elaine N. Marieb (Author), Katja N. Hoehn.</li> <li>• Introduction to the Human Body, 10th Edition</li> <li>• Gerard J. Tortora, Bryan H. Derrickson ISBN: 978-1-118-88413-3, 2014.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based power point presentations, Group interaction and discussion, self-directed activities, and active participation.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Describe the major cavities of the body and the organs they contain.</li> <li>• Explain what a cell is? and explain how human organs and systems interact.</li> </ul>





	<ul style="list-style-type: none"> <li>Describe the major functions of the four types of human tissue.</li> <li>List the major systems of the body, the organs they contain and the functions of those systems.</li> <li>Define the terms anatomy and physiology.</li> <li>Define homeostasis.</li> <li>Describe the relationship between and processes related to nutrition and metabolism; and recognize the stages of growth and development</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1-2)</b>	<ul style="list-style-type: none"> <li>Introduction to Anatomy</li> <li>Levels of organization</li> <li>Body regions, planes, and orientations and body cavities</li> </ul>
<b>Session 2 (Week 3-4)</b>	<ul style="list-style-type: none"> <li>Skeletal system</li> <li>Bone structure and types, cartilage, ligaments, tendons, and joints</li> <li>Axial and appendicular skeletons</li> <li>Scientific terminologies of the main body bones</li> </ul>
<b>Session 3 (Week 5-6)</b>	<ul style="list-style-type: none"> <li>Muscular system</li> <li>Types of muscles, Differences and their microscopic structure</li> <li>Skeletal muscle structure and neuromuscular junction</li> <li>Scientific terminologies of the main body Muscles</li> </ul>
<b>Session 4 (Week 7-9)</b>	<ul style="list-style-type: none"> <li>Cardiovascular (Circulatory) system</li> <li>Components of cardiovascular system and types of circulations</li> <li>The heart, arteries, veins, capillaries, and lymphatic vessels</li> <li>The blood components (plasma and blood cells)</li> <li>Scientific terminologies of the main cardiovascular components</li> </ul>
<b>Session 5 (Week 10-11)</b>	<ul style="list-style-type: none"> <li>Respiratory system</li> <li>Upper respiratory system (nose, pharynx, larynx, and trachea)</li> <li>Lower respiratory system (Lungs, thoracic cage, and pleura)</li> <li>Bronchi, bronchioles, alveoli and respiratory membrane</li> <li>Respiratory muscles and lung volumes and capacities</li> <li>Scientific terminologies of the main respiratory system parts</li> </ul>
<b>Session 6 (Week 12-14)</b>	<ul style="list-style-type: none"> <li>Digestive system</li> <li>Upper digestive system (mouth, pharynx, and esophagus)</li> <li>Lower digestive system (stomach, small intestine, and large intestine)</li> <li>Structure of digestive system walls</li> <li>Accessory parts of the digestive system (salivary gland, teeth, pancreas, liver, and gall bladder)</li> <li>Scientific terminologies of the main Digestive system parts</li> </ul>
<b>Session 7 (Week 15)</b>	<b>Midterm Exam</b>
<b>Session 8(Week 16-17)</b>	<ul style="list-style-type: none"> <li>Integumentary system</li> <li>Skin structure and types</li> <li>Skin layers and skin color</li> <li>Receptors and glands</li> <li>Skin burns and disorders</li> <li>Scientific terminologies of the main skin structures</li> </ul>







<b>Session 9 (Week 18-19)</b>	<ul style="list-style-type: none"> <li>• Urinary system</li> <li>• The main parts of the urinary system</li> <li>• Kidney structure</li> <li>• Nephron and Glomerulus</li> <li>• Types of blood vessels in the kidney</li> <li>• Uterus, bladder and urethra</li> <li>• Scientific terminologies of the main urinary system parts</li> </ul>
<b>Session 10 (Week 20-22)</b>	<ul style="list-style-type: none"> <li>• Endocrine system</li> <li>• Endocrine glands names and locations</li> <li>• Structure, location, and hormones of hypothalamus and pituitary gland</li> <li>• Structure, location, and hormones of thyroid and parathyroid glands</li> <li>• Structure, location, and hormones of pineal and thymus glands</li> <li>• Structure, location, and hormones of pancreas and adrenal glands</li> <li>• Structure, location, and hormones of the ovaries and testicles gland</li> <li>• Structure, location, and hormones of other glandular structures</li> <li>• Scientific terminologies of the main endocrine glands</li> </ul>
<b>Session 11 (Week 23-24)</b>	<ul style="list-style-type: none"> <li>• Reproductive system</li> <li>• Reproductive systems of male and female</li> <li>• Structure and hormones of the ovaries and testes</li> <li>• Production of the sperms and ova</li> <li>• Scientific terminologies of the main parts of reproductive system parts</li> </ul>
<b>Session 12 (Week 25-26)</b>	<ul style="list-style-type: none"> <li>• Central Nervous system</li> <li>• brain, spinal cord, &amp; peripheral nerves</li> <li>• Neurons (types and structure)</li> <li>• Neurotransmitters and synapses</li> <li>• Scientific terminologies of the main parts of the central nervous system parts</li> </ul>
<b>Session 13 (Week 27-28)</b>	<ul style="list-style-type: none"> <li>• Autonomic Nervous system</li> <li>• Sympathetic and parasympathetic autonomic nervous system</li> <li>• Preganglionic and postganglionic neurons</li> <li>• Neurotransmitters in the sympathetic and parasympathetic autonomic nervous system</li> <li>• Scientific terminologies of the main parts of the autonomic nervous system parts</li> </ul>
<b>Session 14 (Week 29)</b>	Revision and discussion
<b>Session 15 (Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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.
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## 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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Lippincott's Illustrated Reviews: Biochemistry. ISBN-13: 978-1496344496 ISBN-10: 1496344499.</li> <li>• Harper's Illustrated Biochemistry. ISBN-13: 978-1259837937. ISBN-10: 1259837939.</li> <li>• Leininger Principles of Biochemistry. ISBN-13: 978-1429234146. ISBN-10: 1429234148.</li> <li>• Textbook of Medical Biochemistry. ISBN-13: 978-9350254844. ISBN-10: 9350254840.</li> <li>• Clinical Chemistry Techniques, Principles, Correlations. ISBN-13: 978-1496335586. ISBN-10: 9781496335586.</li> <li>• Additional textbooks and web links may be used in this course at the discretion of the instructor.</li> <li>• <a href="http://www.kume.edu/biochemistry/resource.html">http://www.kume.edu/biochemistry/resource.html</a></li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• The chemical nature of carbohydrate, lipid, protein, nucleotide and vitamin biomolecules; and the principles of bioenergetics and enzyme catalysis.</li> <li>• 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</li> </ul>







	<p>selectively expressed as functional proteins and RNA and how this expression is regulated.</p> <ul style="list-style-type: none"> <li>• The tools used in biochemistry, and their potential applications to medical technology science.</li> <li>• The commonly used measurements in clinical biochemistry and how these measurements can contribute to assessment of the health status of individuals.</li> <li>• Use correct terminology to discuss the chemistry, cell structure, and tissues of the human body.</li> <li>• Identify and explain the structure and functions of each body system.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 %</p> <p>A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	• Introduction and definition of biochemistry
<b>Session 2 (Week 2)</b>	Biochemistry of the cell
<b>Session 3 (Week 3&amp;4)</b>	• Body fluids of the cell
<b>Session 4 (Week 5 &amp; 6)</b>	• biochemistry of the cell
<b>Session 5(Week 7,8)</b>	• Chemistry of Carbohydrate
<b>Session6(Week 9)</b>	• Nucleotide
<b>Session 7(Week 10)</b>	• Nucleic acid
<b>Session 8(Week 11)</b>	• Chemistry of Lipids
<b>Session9(Week 12)</b>	<b>Midterm Exam</b>
<b>Session10(Week 13)</b>	• Chemistry of Lipids
<b>Session11(Week 14 &amp; 15)</b>	<b>Midterm practical exam</b>
<b>Session12(Week 16)</b>	•Enzymes
<b>Session13(Week 17)</b>	• Porphyrins
<b>Session14(Week 18 &amp; 19)</b>	Hemoglobin
<b>Session15(Week 20)</b>	•Vitamins
<b>Session16(Week 21)</b>	Revision of lecture
<b>Session17(Week22 &amp; 23)</b>	•Carbohydrate Metabolism
<b>Session18(Week 24 &amp; 25)</b>	•Lipid metabolism
<b>Session19(Week 26,27)</b>	•Protein Chemistry and Metabolism
<b>Session20(Week 28)</b>	Revision of lecture
<b>Session21 (Week 29)</b>	<b>Final practical Exam</b>
<b>Session22 (Week 30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Text book of microbiology First Published in 2010 by Prem C. Bakliwal for Aavishkar Publishers ISBN 978-81-7910-306-7.</li> <li>• <a href="https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf">https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf</a></li> <li>• <a href="https://open.umn.edu/opentextbooks/textbooks/873">https://open.umn.edu/opentextbooks/textbooks/873</a></li> <li>• <a href="https://www.britannica.com/science/microbiology">https://www.britannica.com/science/microbiology</a></li> <li>• <a href="https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/1%3A_Introduction_to_Microbiology">https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/1%3A_Introduction_to_Microbiology</a></li> <li>• <a href="https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf">https://faculty.ksu.edu.sa/sites/default/files/140_mbio-final_notes.pdf</a></li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of the structural similarities and differences among microbes and the unique structure/function relationships of prokaryotic cells.</li> <li>• Comprehend the fundamentals of molecular microbiology.</li> <li>• Appreciate the diversity of microorganisms and microbial communities and recognize how microorganisms solve the fundamental problems their environments present.</li> </ul>







	<ul style="list-style-type: none"> <li>Recognize how the underlying principles of epidemiology of disease and pathogenicity of specific microbes affect human health.</li> <li>Understand Microbial Cell Structure, Function and methabolism.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction, of microbiology
<b>Session 2 (Week 2)</b>	History of Microbiology
<b>Session 2 (Week 3)</b>	Defining Microbes and Basic concepts and scope of microbiology
<b>Session 3 (Week 4)</b>	Pasteur and spontaneous Generation
<b>Session 4 (Week 5 &amp; 6)</b>	Types of microorganisms
<b>Session 5(Week 7,8)</b>	Classification of microorganisms
<b>Session6(Week 9)</b>	Immunization, antiseptics and antibiotics
<b>Session 7(Week 10)</b>	Microscopy
<b>Session 8(Week 11)</b>	Bacteria : 1-Naming, Shape and arrangement, Classification, Size
<b>Session9(Week 12)</b>	<b>Bacterial structure &amp; composition</b>
<b>Session10(Week 13)</b>	Bacterial Genetics
<b>Session11(Week 14 &amp; 15)</b>	Microbial Growth (growth and metabolism of Bacteria): Requirement of Microbial Growth: physical and chemical requirements. Culture media
<b>Session12(Week 16)</b>	<b>Midterm exam</b>
<b>Session13(Week 17)</b>	Isolation and culturing of Bacteria
<b>Session14(Week 18 &amp; 19)</b>	Microbial metabolism
<b>Session15(Week 20)</b>	Classification of bactria
<b>Session16(Week 21)</b>	Dyes and staining (gram stain, acid fast staining, and other staining metods).
<b>Session17(Week22 &amp; 23)</b>	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
<b>Session18(Week 24 &amp; 25,26)</b>	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
<b>Session19(Week 27,28)</b>	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
<b>Session21 (Week 29)</b>	<b>Final practical Exam</b>
<b>Session22 (Week 30)</b>	<b>Final Exam</b>



<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Histology
2	<b>Course Code</b>	MT204
3	<b>Course type: /general/specialty/optional</b>	General
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	non
7	<b>Program offered the course</b>	Medical Technology Prog.
8	<b>Instruction Language</b>	English
9	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		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
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• DiFiore's atlas of histology with functional correlations. Junqueira's Basic Histology.</li> <li>• Histology: An Essential Textbook by D. J. Lowrie Jr 2020</li> <li>• Junqueira's Basic Histology: Text and Atlas, Sixteenth Edition by Anthony L. Mesche 2021</li> <li>• Textbook of Histology by Leslie P. Gartner PhD 2021</li> <li>• Histology: A Text and Atlas 7<sup>th</sup> edition : With Correlated Cell and Molecular Biology by Ross, Michael H., M.D. Pawlina, Wojciech 2015</li> <li>• Wheater's Functional Histology: A Text and Colour Atlas 3<sup>rd</sup> edition by William K. Ovalle Ph.D., Patrick C. Nahirney PhD 2020</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours





<b>Delivery</b>	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
<b>Course Objectives:</b>	Upon completion of this course, the student will have reliably demonstrated the ability to: <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Understand the changes that occur to tissues</li> <li>• Identify the different types of tissues</li> <li>• Recognize the types of tissues and the mechanisms of identifying them</li> <li>• understand the various diagnostic tools and medical equipment in the correct way to discover histological changes</li> <li>• Understand how to distinguish tissue and how it develops</li> <li>• deduce the causes of the changes that have occurred within the tissues</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 %    Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	• Introduction to histology • histology and its mode of study
<b>Session 2 (Week 2)</b>	• The cell
<b>Session 3 (Week 3)</b>	• Epithelial Tissue
<b>Session 4 (Week 4)</b>	• Connective tissue
<b>Session 5 (Week 5)</b>	• Cartilage
<b>Session 6 (Week 6)</b>	• Bone
<b>Session 7 (Week 7)</b>	• Bone.
<b>Session 8 (Week 8)</b>	Muscle Tissue
<b>Session 9 (Week 9)</b>	Nerve Tissue
<b>Session 10 (Week 10)</b>	• Nervous System
<b>Session 11 (Week 11)</b>	The Immune System &
<b>Session 12 (Week 12)</b>	Lymphoid Organs
<b>Session 13 (Week 13)</b>	Blood and Hemopoiesis
<b>Session 14 (Week 14)</b>	Endocrine System
<b>Session 15 (Week 15)</b>	Hormones
<b>Session 16 (Week 16)</b>	The integumentary system
<b>Session 17 (Week 17)</b>	The Circulatory system
<b>Session 18 (Week 18)</b>	The Circulatory system
<b>Session 19 (Week 19)</b>	The Circulatory system
<b>Session 20 (Week 20)</b>	• Respiratory system
<b>Session 21 (Week 21)</b>	Respiratory system





<b>Session 22 (Week 22)</b>	Respiratory system
<b>Session 23 (Week 23)</b>	Digestive system
<b>Session 24 (Week 24)</b>	The urinary system
<b>Session 25 (Week 25)</b>	The urinary system
<b>Session26(Week26- 27)</b>	Reproductive system
<b>Session 28 (Week 28)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		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)
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.ISBN 0-7216-0240-1</li> <li>• Principles of anatomy and physiology/Arthur Gerard J., Bryan D. – 12<sup>th</sup> ed.ISBN 978-0-470-08471-7</li> <li>• Human physiology / ArthurMAGDI SABRY, MD -5thed. JSBN 977. 203- 256-2</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor Microbiology text book can be used,</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		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.
<b>Course Objectives:</b>		<p>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:</p> <ul style="list-style-type: none"> <li>• Have sufficient basic knowledge in medical physiology.</li> <li>• Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.</li> <li>• State the functions of each organ system of the body, explain the mechanisms by which each functions, and</li> </ul>



	<p>relate the functions and the anatomy and histology of each organ system.</p> <ul style="list-style-type: none"> <li>• Understand and demonstrate the interrelations of the organ systems to each other.</li> <li>• Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses.</li> <li>• Explain the pathophysiology of common diseases related to the organ systems of the body</li> <li>• The ability to understand, recognize different medical term and identify the normal function and diseases of human organ body.</li> <li>• 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.</li> </ul>
<b>Course Assessments</b>	<p>Midterm exam 20 %    Activity 10 %  Attendance 10 %    Final Exam 60 %  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<p>Introduction, Autonomic nervous system, Blood, Nerve &amp; muscle, Cardiovascular system, Respiratory system, Gastrointestinal tract, Renal system, Central Nervous system, Special senses, Reproductive system and Endocrine)</p> <ul style="list-style-type: none"> <li>▪ Inform students how student learning program of the year-wise has been organized</li> <li>Help students organize and manage their studies throughout the year-</li> <li>▪ Inform students how student learning program of the year-wise has been organized</li> <li>Help students organize and manage their studies throughout the yea</li> <li>▪ Guide students on assessment methods, rules and regulations</li> <li>● Introduction ( Total body water , cell membrane and cell transport)</li> </ul>
<b>Session 2 (Week 2)</b>	<p>Autonomic Nervous System</p> <ul style="list-style-type: none"> <li>● Types Autonomic Nervous System</li> <li>• Chemical neurotransmitters</li> <li>● Function of sympathetic &amp; Parasympathetic</li> </ul> <p>Assignment 2 handed out</p>
<b>Session 3 (Week 3)</b>	<p>The blood:</p> <ul style="list-style-type: none"> <li>• Major components and function of the blood</li> <li>• Red &amp; white blood cells</li> <li>• Plasma protein and function</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Blood groups &amp; hemostasis</li> </ul> <p>Blood clotting disorders</p>
<b>Session 5 (Week 5)</b>	<p>Nerve &amp; Muscle</p> <ul style="list-style-type: none"> <li>• Structure of nerve cell</li> <li>• Properties of neuron</li> <li>• Resting membrane potential</li> </ul>
<b>Session 6 (Week 6)</b>	Nerve & Muscle



	<ul style="list-style-type: none"> <li>• Action potential</li> <li>• Excitation- contraction coupling</li> <li>• Mechanism of muscle contraction &amp; relaxation</li> </ul>
Session7(Week 7)	Cardiovascular system <ul style="list-style-type: none"> <li>• Anatomy of the heart</li> <li>• Functional properties of cardiac muscle</li> <li>• Action potential &amp; Conducting System</li> </ul>
Session 8(Week 8)	<ul style="list-style-type: none"> <li>• Cardiac Cycle &amp; Heart sound</li> <li>• Electrocardiograph</li> </ul>
Session 9(Week 9)	<ul style="list-style-type: none"> <li>• Blood pressure</li> <li>• Cardio dynamic</li> <li>• Arrhythmia &amp; circulatory Shock</li> </ul>
Session10(Week 10)	<ul style="list-style-type: none"> <li>• Arrhythmia</li> <li>• circulatory Shock</li> </ul>
Session11(Week 11)	Respiratory System <ul style="list-style-type: none"> <li>• Structure of the respiratory system</li> <li>• Lung volume &amp; Capacities</li> </ul>
Session12(Week 12)	<ul style="list-style-type: none"> <li>• Oxygen &amp; Carbon Dioxide in blood</li> <li>• Dissociation oxygen curve shift</li> </ul>
Session13(Week 13)	<ul style="list-style-type: none"> <li>• Transport carbon dioxide</li> <li>• Regulation of respiratory</li> <li>• Hypoxia</li> </ul>
Session14(Week 14)	Nervous System <ul style="list-style-type: none"> <li>• Division of the nervous system</li> <li>• Units of Nervous system</li> <li>• Types of Receptors</li> </ul>
Session15(Week 15)	<b>Mid exam</b>
Session15(Week 16)	Nervous System: <ul style="list-style-type: none"> <li>• Properties of receptors, Synapse, Types of synapse, Mechanism of neurotransmitter</li> </ul>
Session16(Week 17)	<ul style="list-style-type: none"> <li>• Somatic sensation</li> <li>• Types Somatic sensation               <ul style="list-style-type: none"> <li>• Pain sensation</li> </ul> </li> <li>• Pathways</li> </ul>
Session17(Week 18)	<ul style="list-style-type: none"> <li>• Referred Pain</li> <li>• Pain Control System</li> </ul>
Session18(Week19)	Special senses <ul style="list-style-type: none"> <li>• Vision</li> <li>• Hearing</li> </ul>
Session19(Week 20)	<ul style="list-style-type: none"> <li>• Special senses</li> <li>• Gustation</li> <li>• Olfaction</li> </ul>
Session20(Week 21)	Gastrointestinal tract <ul style="list-style-type: none"> <li>• characteristics of gastrointestinal wall</li> <li>• Explain functional types of movements in GIT</li> <li>• Control of GIT</li> </ul>
Session21(Week 22)	<ul style="list-style-type: none"> <li>• GIT hormones and their role in digestive process</li> <li>• Describe GIT reflexes</li> <li>• Mastication and salivary secretions</li> </ul>
Session22 (Week 23)	<ul style="list-style-type: none"> <li>• Describe motor functions of stomach</li> <li>• Explain regulation of stomach emptying &amp; the composition, function and • regulation of gastric secretions</li> <li>• Vomiting reflex</li> </ul>






<b>Session23 (Week 24)</b>	<ul style="list-style-type: none"> <li>•Gall bladder and biliary tract</li> <li>•intestinal motility</li> <li>•Defecation reflex</li> </ul>
<b>Session25 (Week 25,26)</b>	Urinary system <ul style="list-style-type: none"> <li>•The kidney and Urine formation</li> <li>•Micturition</li> <li>•Renal failure</li> <li>•Male reproductive and Female reproductive</li> </ul>
<b>Session26 (Week 27,28)</b>	Endocrine System Pituitary gland Thyroid gland and Parathyriod Adernal gland and Endocrine cell in other organs
<b>Session27 (Week 29)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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%
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	Medical psychology& Teaching Methodology
2	<b>Course Code</b>	<b>MT206</b>
3	<b>Course type:</b> <b>/general/specialty/optional</b>	General
4	<b>Accredited units</b>	2
5	<b>Educational hours</b>	2 hours per week
6	<b>Pre-requisite requirements</b>	Non
7	<b>Program offered the course</b>	Medical Technology Prog
8	<b>Instruction Language</b>	English




9	Date of course approval	2022
<b>Brief Description:</b>	<p>First 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.</p> <p>Second part of the course will cover different teaching methods and techniques.</p>	
<b>Textbooks required for this Course:</b> 	<ul style="list-style-type: none"> <li>• Textbook of Medical Psychology Hardcover – January 1, 1961</li> <li>• <a href="https://bookauthority.org/books/best-medical-psychology-books">https://bookauthority.org/books/best-medical-psychology-books</a></li> <li>• <a href="https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4">https://www.elsevier.com/books/medical-psychology/prokop/978-0-12-565960-4</a></li> <li>• Anthony, Michael J. Introducing Christian Education: Foundations for the Twenty-first Century. Baker Academic, 2001.</li> <li>• Armstrong, Thomas. Multiple Intelligences in the Classroom: 2<sup>nd</sup> Edition. Association for Supervision and Curriculum Development, 2000.</li> <li>• Dawn, Marva J. Is It A Lost Cause? Having the Heart of God for the Church's Children. William B Eerdmans Publishing Company, 1997.</li> <li>• Unfettered Hope: A Call to Faithful Living in an Affluent Society. Westminster John Knox Press, 2003.</li> <li>• Durka, Gloria. The Teachers Calling: A Spirituality for Those Who Teach. Paulist Press, 2002.</li> <li>• Church Educational Ministries: More than Sunday School. Evangelical Training Association, 1985.</li> <li>• Teaching Techniques for Church Education. Evangelical Training Association, 1983.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>	
<b>Course Duration</b>	2* 28 = 56 teaching hours	
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.	
<b>Course Objectives:</b>	<p>Upon completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the principle domains of psychology that are most relevant to medicine.</li> <li>• Know the key areas of psychology that would provide the basis for viewing people not only as biological but also as psychological beings.</li> <li>• Be familiar with the application of psychology in the wider practice of medicine.</li> <li>• understand the interaction between psychological and medical principles in the development, assessment and diagnosis and in the treatment of medical illnesses.</li> <li>• Will be able to define and list the fruits of the spirit.</li> </ul>	



	<ul style="list-style-type: none"> <li>The student will be able to explain why the fruit of the spirit are important to believers.</li> <li>The student will be able to assess which fruits are most and least evident in their own lives.</li> <li>The student will develop a plan to practice more of the fruit of the spirit for the next week</li> <li>Understand the basics of teaching methods</li> <li>Know different techniques of teaching and questions preparations.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %    Activity 10 % Attendance 10 %    Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An introduction to Medical psychology
<b>Session 2 (Week 2)</b>	Psychology and Medicine <ul style="list-style-type: none"> <li>Explain what the field of Psychology studies.</li> <li>Describe the different areas of Psychology.</li> <li>Describe the way by which Psychology is linked to Medicine.</li> </ul>
<b>Session 3 (Week3-4)</b>	Brain Mechanisms and Behaviour <ul style="list-style-type: none"> <li>Describe the basics of Neural Communication.</li> <li>Explain the Basic Structure and function of the Nervous system.</li> <li>Outline the link between biology and behavior.</li> </ul>
<b>Session 4 (Week 5)</b>	Senses and Integration on Senses <ul style="list-style-type: none"> <li>Describe the role and the importance of the different types of senses.</li> <li>Outline the main functional theories of vision.</li> <li>Outline the main functional theories of audition.</li> <li>Outline the main theories of somatosensation.</li> <li>Outline the main theories of the functions of smell</li> </ul>
<b>Session5 (Week 6)</b>	<ul style="list-style-type: none"> <li>Perception, attention and Memory</li> <li>Outline the role of the different types of perception.</li> <li>Describe the main theories of visual perception.</li> <li>Describe the main theories of auditory perception.</li> <li>Outline the main types of attention.</li> <li>Describe the main theories of attention.</li> <li>Outline the main types of memory.</li> <li>Describe the main theories of memory</li> </ul>
<b>Session 6 (Week 7)</b>	Child Development (from birth to adolescence) <ul style="list-style-type: none"> <li>Describe the different stages of development from birth to adolescence.</li> <li>Outline the main theories of child development.</li> <li>Outline the main theories of early stages of language acquisition.</li> <li>Describe the main theories of language development.</li> <li>Outline the theories connecting language and cognition.</li> <li>Language and the brain.</li> </ul>
<b>Session 7(Week 8)</b>	Language, Motivation and Emotions





	<p>Individual Differences in Intelligence and Personality</p> <ul style="list-style-type: none"> <li>• Outline the area of Motivation.</li> <li>• Outline the way by which motivation is link with emotion.</li> <li>• Outline the main theories of Emotions.</li> <li>• Describe the biological theories of emotions.</li> <li>• Describe the psychological theories of emotions.</li> <li>• Outline the role of individual differences as observed in everyday activities and as measured by psychometric tools.</li> <li>• Outline the main Psychometric tools and their role in diagnosis.</li> <li>• Outline the main Personality tests and their value in clinical assessment.</li> </ul>
<p><b>Session 8 (Week 9)</b></p>	<p>Adulthood and Sexual Behaviour</p> <ul style="list-style-type: none"> <li>• Describe the characteristics of Adulthood.</li> <li>• Outline the interconnection between psychological and biological characteristics of this stage of human development.</li> <li>• Distinguish between Psychoanalytic and Psychological views on sexuality.</li> <li>• Describe the role of sex in human relationships</li> <li>• Describe the psychological factors contributing to our better understanding of sexual behaviour between sexes.</li> </ul>
<p><b>Session 9 (Week 10)</b></p>	<ul style="list-style-type: none"> <li>• Sleep, Consciousness, Family Aging, Death and Bereavement</li> <li>• Explain the different stages of sleep as described by EEG studies</li> </ul> <p>Outline the three theories of sleep.</p> <ul style="list-style-type: none"> <li>• Explain the usefulness of sleep with reference to research studies on total and on selective sleep deprivation.</li> <li>• Describe the role of the family from a developmental perspective and its contributory role in the development of individuals as social and biological beings.</li> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> <li>• Describe the conclusion of the human life cycle and the way by which psychology and biology are interconnected.</li> <li>• Outline the impact of death on both the dying person and the family.</li> </ul>
<p><b>Session 10 (Week 11)</b></p> 	<p>Psychology and Medicine: Patients and Doctors</p> <ul style="list-style-type: none"> <li>• Outline the role played by psychological factors such as emotions and stress in the development of illnesses and/or dysfunctions.</li> <li>• Outline the Biomedical and the Biopsychosocial Approaches to Medicine.</li> <li>• Identify the advantages and disadvantages of each approach in the development of modern medicine.</li> <li>• Outline the impact of psychological principles in doctor patient contact and communication.</li> </ul>



<b>Session 11 (Week 12)</b>	<p>Psychosomatic Problems, Psychosocial Aspects of Hospitalization and Psychosocial Approaches Treatment</p> <ul style="list-style-type: none"> <li>• Describe the different factors contributing to the impact that hospitalisation has on people.</li> <li>• Describe the potential psychological impact that hospitalisation may have on people.</li> <li>• Outline the role of psychosocial approaches in medical practice.</li> <li>• Outline the role of placebo effect in the treatment of both physical and psychological treatments.</li> <li>• Describe the role of psychological principles and psychoeducation in facilitating problem solving and diagnosis.</li> <li>• Outline the way by which psychological factors contribute to the development of somatic problems.</li> <li>• Describe different types of psychosomatic problems.</li> <li>• Outline possible ways of distinguishing between psychosomatic and physical problems.</li> </ul>
<b>Session 12 (Week 13)</b>	<p>Coping with illness and Disability, Psychopathology and Mental illness and Rehabilitation</p> <ul style="list-style-type: none"> <li>• Outline the psychological factors contributing to coping with illness and disability.</li> <li>• Describe the different approaches and techniques employed for coping with these difficulties.</li> <li>• Outline the different areas of Psychopathology.</li> <li>• Outline the methods employed in the diagnosis of psychological and psychiatric disorders.</li> <li>• Outline the treatments often used in the treatment of psychiatric and psychological disorders.</li> <li>• Explain what is meant by chronic mental illness and the process of rehabilitation.</li> </ul>
<b>Session 14 (Week 14)</b>	<b>Midterm Exam</b>
<b>Session 16 (Week 16)</b>	<ul style="list-style-type: none"> <li>• Teaching Principles</li> </ul>
<b>Session 17 (Week 17)</b>	<ul style="list-style-type: none"> <li>• Student Centered vs. Teacher Centered Learning</li> </ul>
<b>Session 18 (Week 18)</b>	<ul style="list-style-type: none"> <li>• Learning Styles</li> </ul>
<b>Session 19 (Week 19)</b>	<ul style="list-style-type: none"> <li>• Creating a Lesson: Overview</li> <li>• Creating a Lesson: Goals</li> <li>• Creating a Lesson: Outcomes</li> </ul>
<b>Session 20 (Week 20)</b>	<ul style="list-style-type: none"> <li>• Creating a Lesson: Information Delivery</li> </ul>
<b>Session 21(Week 21-22)</b>	<ul style="list-style-type: none"> <li>• Teaching Methods</li> </ul>
<b>Session 22 (Week 23)</b>	<ul style="list-style-type: none"> <li>• Creating a Lesson: Activities</li> </ul>
<b>Session 23 (Week 24)</b>	<ul style="list-style-type: none"> <li>• Creating a Lesson: Measurement</li> </ul>
<b>Session 24 (Week 25)</b>	<ul style="list-style-type: none"> <li>• Creating a Lesson: Evaluation</li> </ul>
<b>Session 25 (Week 26)</b>	<ul style="list-style-type: none"> <li>• The Teacher's Responsibilities</li> </ul>
<b>Session26(Week27-28)</b>	<ul style="list-style-type: none"> <li>• Presentations</li> </ul>
<b>Session27(Week29)</b>	Revision and discussion
<b>Session28(Week 30-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	<p>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.</p>





<b>Generic Skills</b>	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.
<b>Course Change</b>	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

<b>1</b>	<b>Course name</b>	<b>Professional Ethics</b>
<b>2</b>	<b>Course Code</b>	<b>MT207</b>
<b>3</b>	<b>Course type: /general/specialty/optional</b>	General
<b>4</b>	<b>Accredited units</b>	2
<b>5</b>	<b>Educational hours</b>	2 hours per week
<b>6</b>	<b>Pre-requisite requirements</b>	Non
<b>7</b>	<b>Program offered the course</b>	Medical Technology Prog.
<b>8</b>	<b>Instruction Language</b>	English
<b>9</b>	<b>Date of course approval</b>	2022
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• القيم الخلقية وتطبيقاتها العملية، د. عبد الباسط الأمير</li> <li>• مقدمة في زراعة الاعضاء، د. الهادي عصمان</li> <li>• WMA medical ethics manual 2015</li> <li>• <a href="#">Principles of Biomedical Ethics, 5th edn.</a></li> <li>• <a href="https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4">https://www.elsevier.com/books/medical-ethics-and-law/wilkinson/978-0-7020-7596-4</a></li> </ul>
<b>Course Duration</b>		2 * 28 = 56 teaching hours
<b>Delivery</b>		Lectures, Problem based learning and Class discussion.
<b>Course Objectives:</b>		This course introduces medical technology students to the field of medical ethics. The objective of the course is:



	<ul style="list-style-type: none"> <li>To convey to students, the pivotal role ethics holds in medical practice.</li> <li>It introduces the key underlying ethical principles required in medicine.</li> <li>The application of these principles will be brought to life through case based learning (CBL).</li> <li>Recognize ethical issues when they arise in their practice</li> <li>Deal with these issues in a systematic manner</li> <li>Understand the ethics of medical research</li> <li>To create an awareness on medical Ethics and Human Values.</li> <li>To instill Moral and Social Values and Loyalty</li> <li>To appreciate the rights of others.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 % Activity 10 % Attendance 10 % Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction and history of medical ethics
<b>Session 2 (Week 2)</b>	Principles of medical ethics
<b>Session 3 (Week 3-5)</b>	Physicians and patients, Physicians and society Physicians and colleagues
<b>Session 4 (Week 6 -7)</b>	Ethics of medical research
<b>Session5 (Week 8 - 9)</b>	Informed consent
<b>Session6 (Week 10 - 11)</b>	Ethics of gynecology and obstetrics Ethics of infertility
<b>Session 7 (Week 12 -13)</b>	Ethics of healthcare system
<b>Session 8(Week 14)</b>	Professionalism
<b>Session 10(Week 15)</b>	Review and general discussion
<b>Session 11(Week 16)</b>	<b>Med term exam</b>
<b>Session 12(Week17-18)</b>	Medical errors
<b>Session13(Week 19-20)</b>	Libya law of medical responsibility
<b>Session 14 (Week 21-22)</b>	Humanism in medicine and Ethics of end of life
<b>Session 15 (Week 23)</b>	Ethics of authorship and publication
<b>Session 16 (Week 24-25)</b>	Ethics of medical education
<b>Session 17 (Week26-27)</b>	Theories of ethics
<b>Session18(Week28)</b>	Revision and discussion
<b>Session19(Week 29-32)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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 will be able to:

- Learn concepts and theories in health care management;
- Develop skills in using materials tools and/or technology central to health care mgt;



	<ul style="list-style-type: none"> <li>Learn to understand perspectives and values of health care management;</li> <li>Develop the basic management skills and ability to work productively with others;</li> <li>Learn to select, use, and critically analyze current HCMN research and literature;</li> <li>Integrate health care management theory with real world situations</li> <li>Develop the ability to work productively with others in diverse teams.</li> <li>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.</li> </ul>
<b>Course Assessments</b>	Midterm exam 20 %      Activity 10 % Attendance 10 %      Final Exam 60 % A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	An Introduction to the Health management
<b>Session 2 (Week 2)</b>	The historical role of medical and nursing health services
<b>Session 3 (Week 3)</b>	Hospital Operation Management Epidemiological basis for healthcare management. Management development-towards development of professional management of the Health system>
<b>Session 6(Week 6)</b>	Hospital concept and classification hospital environment
<b>Session 7 (Week 7)</b>	Hospital health planning
<b>Session 8 (Week 8)</b>	The organizational structure of the hospital
<b>Session 9(Week 9)</b>	Hospital Operational Management Management of Quality Assured services of professional service units of hospitals. Quality control mechanisms.
<b>Session 10(Week 10)</b>	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
<b>Session 11(Week 11)</b>	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
<b>Session 12(Week 12)</b>	Leadership and management An overview of healthcare management and leadership
<b>Session 13(Week 13)</b>	Management and motivation
<b>Session 14(Week 14)</b>	<b>Midterm Exam</b>
<b>Session 15(Week 15)</b>	Organizational Behavior (OB) and Management Thinking
<b>Session 16(Week 16)</b>	Quality Improvement
<b>Session 17(Week 17)</b>	Health care information Technology





	Health and Nursing Information Collection System
<b>Session 18(Week 18)</b>	Healthcare Financing, Cost and revenue management
Session 19(Week 19-20)	Health Care Professionals Management Health personnel management The Strategic Management of Human Resources
<b>Session 20(Week 21)</b>	Addressing Health Disparities: Cultural Proficiency, Ethics and Law.
<b>Session 21(Week22)</b>	Fraud and abuse
<b>Session 22(Week 23)</b>	Communication, health administration
<b>Session 23(Week 24)</b>	Administrative Support in Healthcare Organizations
<b>Session 24(Week 25)</b>	Clinical Care in Healthcare Organizations
<b>Session 25(Week 27)</b>	Medical Laboratories Management
<b>Session 26(Week 28)</b>	Revision and discussion
<b>Session 27(Week 29-30)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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	<b>Course name</b>	<b>Pathology</b>
2	<b>Course Code</b>	MT305
3	<b>Course type:</b> /general/specialty/optional	Specialty
4	<b>Accredited units</b>	3
5	<b>Educational hours</b>	4 hours per week
6	<b>Pre-requisite requirements</b>	Non
7	<b>Program offered the course</b>	Dental Technology Prog
8	<b>Instruction Language</b>	ENGLISH
9	<b>Date of course approval</b>	2022

<b>Brief Description:</b>	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
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	cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis of Disease 10th Edition - May 18, 2020</li> <li>• Robbins &amp; 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</li> <li>• Human Diseases: Systemic Approach - Text Only - 8th edition 2015 ISBN: 9780133424744.</li> <li>• Textbook of pathology by Harsh Mohan 6<sup>th</sup> edition, ISBN: 978-81-8448-702-2, 2010.</li> <li>• <a href="https://morfoptologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf">https://morfoptologie.usmf.md/wpcontent/blogs.dir/78/files/sites/78/2016/09/Harsh-Mohan-Textbook-of-Pathology-6th-Edition.pdf</a></li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based. Group interaction and discussion. self-directed activities. active participation. Laboratory experiments.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the common terms and definitions used in pathology</li> <li>• Identify of the nature of the disease, including its causes, growth patterns, and consequences</li> <li>• Recognize the biological characteristics that distinguish each disease from the other.</li> <li>• The ability to distinguish the origin of the disease and how it develops</li> </ul> <p>The ability to distinguish the origin of the disease and how it develops</p> <ul style="list-style-type: none"> <li>• That the student distinguishes between the causes of disease, its mechanisms, and the method of treatment</li> <li>• The student will infer the causes of disease and its growth patterns</li> <li>• The student determines the appropriate diagnostic tools and mechanisms to detect the disease</li> </ul>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam 20 %  Attendances 10%                  Final Exam 60%  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• <b>Introduction to pathology</b></li> <li>• Pathology gives explanations of a disease by studying the following four aspects of the disease</li> </ul> <ol style="list-style-type: none"> <li>1. Aetiology</li> <li>2. Pathogenesis</li> </ol>





	<p>3. Morphologic changes</p> <p>4. Functional derangements and clinical significance</p> <ul style="list-style-type: none"> <li>• The causes of disease</li> </ul> <p>Environmental factors</p> <p>Genetic Factors</p>
Session 2 (Week 2)	<p><b>Cell injury.</b></p> <ul style="list-style-type: none"> <li>- Homeostasis &amp; Cellular adaptation.</li> <li>- Cellular injury and its etiology &amp; pathogenesis.</li> <li>- Hypoxic cell injury ( Reversible &amp; Irreversible cell injury ).</li> </ul>
Session 3 (Week 3)	<p><b>Cell injury.</b></p> <ul style="list-style-type: none"> <li>- Free radicals ( sources, effects &amp; destruction of FR ).</li> <li>- Cell injury by chemicals and Cell injury by viruses.</li> </ul>
Session 4(Week 4)	<p><b>Cell injury.</b></p> <ul style="list-style-type: none"> <li>- Cell Aging.</li> <li>- Necrosis, Apoptosis &amp; Gangrene.</li> <li>- Calcification, Pigmentation &amp; Intracellular Accumulations.</li> </ul>
Session 5 (Week 5)	<ul style="list-style-type: none"> <li>• <b>Inflammation .</b></li> <li>a. Acute inflammation &amp; its types.</li> </ul>
Session 6 (Week 6)	b. Chronic inflammation, Granuloma & its types.
Session 7 (Week 7)	<ul style="list-style-type: none"> <li>• <b>Repair and healing.</b></li> </ul>
Session 8 (Week 8)	<ul style="list-style-type: none"> <li>• <b>Infectious diseases.</b></li> <li>a. Bacterial, Viral, Fungal and Parasitic infection - a general outline</li> <li>b. Granulomatous diseases: Tuberculosis, Syphilis, Leprosy, Actinomycosis, Bilhaziasis, typhoid, Amebiasis &amp; Hydatid disease.</li> </ul>
Session 9 (Week 9)	<ul style="list-style-type: none"> <li>• <b>Immunopathology.</b></li> <li>1. Immune mechanism of tissue injury: <ul style="list-style-type: none"> <li>a. Type I hypersensitivity.</li> <li>b. Type II hypersensitivity.</li> <li>c. Type III hypersensitivity.</li> <li>d. Type IV hypersensitivity.</li> <li>e. Tissue transplantation.</li> </ul> </li> </ul>
Session 10 (Week 10)	<p>2. Autoimmune diseases:</p> <ul style="list-style-type: none"> <li>a. Systemic Lupus Erythematosus.</li> <li>b. Rheumatoid arthritis.</li> <li>c. Sjogron's Syndrome.</li> <li>d. Systemic Sclerosis (Scleroderma) and Psoriasis.</li> </ul>
Session 11(Week 11)	<p>3. Immunodeficiency I.D:</p> <p>Congenital "primary I.D, Acquired "secondary I.D, AIDS -</p> <p>Amyloidosis</p>
Session 12(Week 12)	<ul style="list-style-type: none"> <li>• <b>Nutrition disorder.</b></li> </ul> <p>Malnutrition, Obesity and Vitamin deficiency disorders.</p>
Session 13 (Week 13)	<ul style="list-style-type: none"> <li>• <b>Ionizing radiation.</b></li> <li>a. Sources of radiation.</li> <li>b. Mechanisms of radiation injury.</li> <li>c. Effects of ionizing radiation on cells and tissues.</li> </ul>
Session 14(Week 14)	<ul style="list-style-type: none"> <li>• <b>Hemodynamic disorders</b></li> </ul> <p>Edema, Hyperemia, Congestion, Hemorrhage</p>
Session 15Week 15)	, embolism, thrombosis & Infarction & Shock.
Session 16Week 16)	<p><b>GENETIC DISORDERS</b></p> <ul style="list-style-type: none"> <li>a. Single - Gene Defect "Mendelian Disorders"</li> <li>b. Disorders with Multifactorial Inheritance</li> </ul>





<b>Session 17(Week 17)</b>	c. Cytogenic Disorders "Chromosomal Aberations"
<b>Session18(Week18)</b>	<ul style="list-style-type: none"> <li>• <b>Neoplasia.</b></li> </ul> - Tumours, Aetiology & spread, common tumours.
<b>Session19(Week19 - 22)</b>	<b>Respiratory diseases.</b> Pneumonias, Bronchiectasis Emphysema, Chronic bronchitis,Asthma.
<b>Session20(Week23 - 27)</b>	<b>Cardiovascular diseases .</b> - Blood, anemia, Heart and blood Vessels, common congenital anomalies, Rheumatic & Coronary heart diseases
<b>Session 21(Week28 )</b>	<b>Revision and discussion</b>
<b>Session 22(Week29 - 30 )</b>	<b>Final exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Richard Van Noort: Introduction to dental materials, Second edition, UK, 2003.</li> <li>• John F. McCabe and Angus W.G.Walls: Applied dental materials, Ninth edition, Blackwell Publishing Ltd, UK, 2008.</li> <li>• William J. O'Brien: Dental materials and their selection, Third edition, Quintessence Publishing Co, Inc, 2002.</li> <li>• Robert G.Craig, John M.Powers and John C. Wataha: Dental materials; properties and manipulation, Eighth edition, Mosby Inc, 2004.</li> <li>• Additional Resources, Handouts and sheets, also some web links may be used in this course provided after any lecture by instructor</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		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.
<b>Course Objectives:</b>		<p>Upon completion of this course, students should have ability to:</p> <ul style="list-style-type: none"> <li>• Understand the meaning of dental materials and its biocompatibility with the oral cavity and surrounding tissues.</li> <li>• 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.</li> <li>• Recognize the properties of dental materials including physical, chemical, mechanical, optical, thermal, and rheological properties.</li> </ul>





	<ul style="list-style-type: none"> <li>Identify representations, terms, conditions, and the concepts in mixing and pouring of the impression materials .</li> <li>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)</li> <li>Construct models made from gypsum products e.g, stone , plaster and modified/die stone.</li> <li>Distinguish between materials that used in fixed and removable prosthodontics .</li> <li>Write a report on the laboratory steps used in mixing the material with the correct ratio and the techniques used for mixing.</li> <li>Develop a way to workout with the problems made in the restoration as a result of mixing the raw materials.</li> <li>Implement devices used for sintering the porcelain particles for all ceramic restorations or for fusing porcelain on metal restoration.</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam        60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>Introduction to Dental Materials</li> <li>Properties of Materials               <ol style="list-style-type: none"> <li>Mechanical Properties</li> <li>Physical Properties</li> <li>Chemical Properties</li> <li>Optical Properties</li> <li>Rheological Properties</li> </ol> </li> </ul>
<b>Session 2 (Week2 &amp; 3)</b>	<ul style="list-style-type: none"> <li>Gypsum products</li> <li>Materials derived from gypsum               <ol style="list-style-type: none"> <li>Models and dies</li> <li>Impression materials</li> <li>Moulds</li> <li>Refractory investment</li> </ol> </li> <li>Types of Gypsum products               <ol style="list-style-type: none"> <li>Model plaster</li> <li>Dental stone</li> <li>High strength dental stone (die stone)</li> </ol> </li> <li>Setting process / Sequence of setting process</li> <li>Working and setting time</li> <li>Properties of gypsum products               <ol style="list-style-type: none"> <li>Dimensional stability</li> <li>Compressive strength</li> <li>Tensile strength</li> <li>Hardness and abrasion resistance</li> </ol> </li> </ul> Assignment 2 handed out
<b>Session 3 (Week 4 &amp;5)</b>	<ul style="list-style-type: none"> <li>Impression materials</li> <li>Requirements of impression materials</li> <li>Classification of dental impression materials</li> <li>Rigid impression materials</li> </ul>







	<ol style="list-style-type: none"> <li>1. dental compound</li> <li>2. Impression plaster</li> <li>3. Zinc oxide eugenol</li> </ol> <ul style="list-style-type: none"> <li>• Flexible impression materials               <ol style="list-style-type: none"> <li>1. Alginate hydrocolloid</li> </ol> <ul style="list-style-type: none"> <li>-introduction into Alginate</li> <li>-Disadvantages of alginate</li> <li>-Uses of alginate</li> <li>-composition of alginate powder</li> <li>-properties of alginate</li> <li>-selection of Maxillary and mandibular trays</li> </ul> </li> </ul>
<b>Session 4 (Week 6&amp; 7)</b>	<ul style="list-style-type: none"> <li>• Flexible impression materials           <ol style="list-style-type: none"> <li>2. Agar hydrocolloid</li> </ol> <ul style="list-style-type: none"> <li>-Introduction into Agar</li> <li>-composition of Agar</li> <li>-Agar impression trays and syringes</li> <li>-Ingredients of the gel and syringe materials</li> <li>-Properties of Agar</li> </ul> </li> <li>3. Elastomeric impression materials           <ul style="list-style-type: none"> <li>• Polysulfide impression materials               <ul style="list-style-type: none"> <li>-Composition of polysulfide</li> <li>-Classification of polysulfide</li> <li>-Setting reaction of polysulfide</li> <li>-Properties of polysulfide</li> </ul> </li> <li>• Silicone impression materials               <ul style="list-style-type: none"> <li>-Development of silicone impression materials</li> <li>-Types of silicone</li> <li>-Properties of silicone</li> </ul> </li> <li>• Polyether impression materials               <ul style="list-style-type: none"> <li>-Composition and setting reaction of polyether</li> <li>-Properties of polyether</li> </ul> </li> <li>• Disinfection of elastomeric impressions</li> <li>• Elastomeric impression materials for bite registration</li> </ul> </li> </ul>
<b>Session 5 (Week 8 &amp;9)</b>	<ul style="list-style-type: none"> <li>• Mechanical properties I</li> <li>• Types of stresses</li> <li>• stress-strain curve</li> <li>•Elastic modulus</li> <li>•Elastic Moduli of Selected Dental Materials</li> <li>•Proportional Limit and Yield Strength</li> <li>•Yield strength of Selected Dental Materials</li> <li>•Ultimate Strength</li> <li>•Elongation and Compression</li> <li>•Resilience and Toughness</li> <li>•Hardness</li> <li>•Hardness of Selected Dental Surfaces</li> </ul>
<b>Session6(Week10&amp;11)</b>	<ul style="list-style-type: none"> <li>• Mechanical properties II</li> <li>-Fracture toughness</li> <li>-Fatigue properties</li> <li>-Fatigue testing</li> <li>-Impact testing</li> <li>-Testing procedure</li> </ul>
<b>Session7(Week12&amp;13)</b>	<ul style="list-style-type: none"> <li>•Physical properties</li> </ul>



	<ul style="list-style-type: none"> <li>A- Dimensional change and thermal conductivity</li> <li>-Introduction into dimensional change and definition</li> <li>-Dimensional change calculation</li> <li>-Thermal dimensional change</li> <li>-Thermal expansion</li> <li>-Coefficient of thermal expansion of dental materials</li> <li>-Clinical significance</li> <li>-Thermal conductivity</li> <li>-Thermal conductivity of dental materials</li> </ul>
<b>Session 8 (Week 14)</b>	<ul style="list-style-type: none"> <li>•Physical properties</li> <li>B- Electrical and optical</li> <li>-Galvanism and its occurrence</li> <li>- Solving galvanism problem</li> <li>-Corrosion</li> <li>-Ranking orders of electrode potential and reactivity for various metals</li> <li>-Galvanic corrosion</li> <li>-Dry corrosion</li> <li>-Wet corrosion</li> <li>-Consequence of corrosion</li> <li>-Tarnish</li> </ul>
<b>Session9(Week 15&amp;16)</b>	<ul style="list-style-type: none"> <li>•Optical properties</li> <li>-Color</li> <li>- Factors affecting color</li> <li>-Parameters of color</li> <li>-Hue</li> <li>-Value</li> <li>-Chroma</li> </ul>
<b>Session10(Week17)</b>	<b>Midterm Exam</b>
<b>Session11(Week18&amp;19)</b>	<ul style="list-style-type: none"> <li>•Chemical properties</li> <li>-Introduction into chemical properties</li> <li>-Absorption and adsorption</li> <li>-Degradation of polymer</li> <li>-Mechanism of degradation</li> <li>-Assessments of water sorption and soluble fraction of polymer</li> <li>-Comparison between polymers and composites in terms of water sorption</li> <li>-Clinical significance</li> <li>-Tarnish and corrosion of metals</li> <li>-Crevice corrosion</li> <li>-Degradation of ceramics</li> </ul>
<b>Session 12 (Week 21 &amp;22)</b>	<ul style="list-style-type: none"> <li>•Rheological properties</li> <li>-Introduction into rheology</li> <li>-Viscosity</li> <li>-Application</li> <li>-Classification of fluid based on rheology</li> <li>-Newtonian fluid</li> <li>-Pseudoplastic fluid</li> <li>-Dilatant fluid</li> <li>-Plastic fluid</li> <li>-Clinical significance</li> </ul>
<b>Session 13 (Week 23 &amp;24)</b>	<ul style="list-style-type: none"> <li>• Materials fir inlays, onlays , crowns and bridges</li> <li>-Introduction into terms</li> </ul>





	<ul style="list-style-type: none"> <li>-Materials for indirect restoration</li> <li>-Uses of dental ceramics</li> <li>-Characteristics of Ceramics</li> <li>- Composition of Ceramics</li> <li>- Composition of dental porcelains</li> <li>-Types of Porcelain</li> <li>-Properties of Porcelains</li> <li>- Preparation of porcelains</li> <li>-Porcelain-Fused-to-Metal</li> <li>-Advantages and disadvantages</li> </ul>
<b>Session 14 (Week 25 &amp; 26)</b>	<ul style="list-style-type: none"> <li>All ceramic restorations</li> <li>-CAD-CAM system</li> <li>-Uses for metals</li> <li>-Properties of metals</li> <li>-Forming Metal Objects</li> <li>-Alloys</li> <li>-Dental alloys requirements</li> <li>-Alloy composition</li> <li>-Gold alloys</li> <li>-Porcelain-Fused-to-Metal Alloys</li> </ul>
<b>Session15(Week27&amp;28)</b>	<ul style="list-style-type: none"> <li>•Physical properties</li> <li>B- Electrical and optical</li> <li>-Galvanism and its occurrence</li> <li>- Solving galvanism problem</li> <li>-Corrosion</li> <li>-Ranking orders of electrode potential and reactivity for various metals</li> <li>-Galvanic corrosion</li> <li>-Dry corrosion</li> <li>-Wet corrosion</li> <li>-Consequence of corrosion</li> <li>-Tarnish</li> </ul>
<b>Session16(Week29-32)</b>	<b>Practical Final Exam</b> <b>Theoretical and oral final exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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
<b>Brief Description:</b>		This course is designed to the undergraduate students at the 2 <sup>nd</sup> 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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Essential in anatomy and physiology, ISBN-13: 978032191007</li> <li>• Clinical anatomy by region, ISBN: 978-1-60913-446-Colour Atlas of Anatomy, ISBN: 9781582558561</li> <li>• Principles of anatomy &amp; physiology, ISBN: 978-1-118-34500-9</li> <li>• Textbook of Head and Neck Anatomy 4th Edition by James L. Hiatt 2020.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.
<b>Course Objectives:</b>		<p>Upon completion of this course, students should have ability to:</p> <ul style="list-style-type: none"> <li>• Understand human body structures and the head and neck anatomy and organs relationship.</li> <li>• Identify the parts and organs of the head and neck.</li> <li>• Recognize skull bones and foramen in addition the TMJ and cervical vertebra and joints with their movements.</li> <li>• Recognize blood vessels, brain and nerves, and respiratory and digestive organs.</li> <li>• Identify symbols, terms, conditions, and constructions</li> <li>• Construct basic knowledge about the head and neck anatomy.</li> <li>• Write brief descriptions of course topics</li> <li>• Develop students' time management skills.</li> <li>• Implement the anatomy knowledge in specialty subjects.</li> </ul>
<b>Course Assessments</b>		Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>		<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>		• Introduction to anatomy
<b>Session 2 (Week 2)</b>		• Introduction to the skeletal system





	<ul style="list-style-type: none"> <li>• Bones types &amp; structure and Joints types and structure</li> <li>• Introduction to the muscular system (name and types of muscles)</li> </ul>
Session 3 (Week 3)	<ul style="list-style-type: none"> <li>• introduction to the cardiovascular system and lymphatic system <ul style="list-style-type: none"> <li>• Heart and blood vessels circulatory routes</li> <li>• Lymph, lymph node and lymphatic duct</li> </ul> </li> </ul>
Session 4 (Week 4)	<ul style="list-style-type: none"> <li>• Introduction to the nervous system (brain, spinal cord, and nerves)</li> <li>• Organization of the nervous system (central and peripheral)</li> </ul>
Session 5 (Week 5)	<ul style="list-style-type: none"> <li>• Introduction to the respiratory system (organs and organization)</li> <li>• Introduction to the digestive (organs and organization)</li> </ul>
Session 6 (Week 6)	<ul style="list-style-type: none"> <li>• Skull bones (Name, types and classification)</li> <li>• Cranial bones names, features and sutures</li> </ul>
Session 7 (Week 7)	<ul style="list-style-type: none"> <li>• Facial bones names, features and sutures</li> <li>• TMJ (articulation, type and movements allowed)</li> </ul>
Session 8 (Week 8)	<ul style="list-style-type: none"> <li>• Skull foramina and fissures and structures pass through each.</li> </ul>
Session11(Week11)	<ul style="list-style-type: none"> <li>• Cervical vertebra (typical and atypical cervical)</li> <li>• atlantooccipital and atlantoaxial joints (anatomy, type and movements allowed)</li> <li>• intervertebral joints anatomy and movements</li> </ul>
Session12(Week 12)	<ul style="list-style-type: none"> <li>• Nervous system of the head and neck</li> <li>• Cranial nerves (order, components and course)</li> <li>• Cranial nerve lesion reasons results.</li> </ul>
Session 13 (Week 13)	<ul style="list-style-type: none"> <li>• cervical segment of spinal cord</li> <li>• Spinal nerves roots and plexus</li> <li>• Cervical plexus (nerves, and roots)</li> </ul>
Session 14 (Week14)	<ul style="list-style-type: none"> <li>• Blood vessels of the head and neck.</li> <li>• Internal and external carotid branches and supplied areas.</li> <li>• Veins drained head and neck and the tributaries.</li> </ul>
Session15(Week 15)	<ul style="list-style-type: none"> <li>• Respiratory of the Head and neck</li> <li>• Nose, pharynx and larynx anatomy and anatomical position)</li> <li>• Paranasal sinuses (names, function)</li> </ul>
Session16(Week 16)	<b>Midterm exam (principle, practical, and oral)</b>
Session17(Week17- 19)	<ul style="list-style-type: none"> <li>• Digestive of the head and neck.</li> <li>• oral cavity (parts names and boundaries)</li> <li>• salivary glands (names and anatomy)</li> </ul>
	<ul style="list-style-type: none"> <li>• Tongue (anatomy and description)</li> <li>• intrinsic and extrinsic tongue muscles</li> <li>• movements of tongue muscles and innervation</li> </ul>
Session18(Week19- 20)	<ul style="list-style-type: none"> <li>• Soft palate and hard palate structures.</li> <li>• innervation of Soft palate and hard palate</li> </ul>
Session19(Week21&22)	<ul style="list-style-type: none"> <li>• Facial expression muscles (origin, insertion, action, and nerve supply)</li> <li>• scalp layers and muscles.</li> </ul>
Session20(Week23&24)	<ul style="list-style-type: none"> <li>• Muscles of mastication (origin, insertion, action, and nerve supply)</li> </ul>
Session21(Week25&26)	<ul style="list-style-type: none"> <li>• Neck (identifying neck region)</li> <li>• Muscles of the neck * classification of neck muscles</li> <li>• attachments, actions and nerve supply of the neck muscles</li> </ul>
Session 22 (Week 27)	<ul style="list-style-type: none"> <li>• neck muscular triangles (anterior and posterior)</li> <li>• contents of neck triangles</li> </ul>





Session 23 (Week 28)	Revision and discussion
Session24(Week29-32)	<b>Theoretical, oral and Practical final exam</b>
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: <ul style="list-style-type: none"> <li>- Communicate effectively with colleagues.</li> <li>- Work in group (team work) and Time management.</li> <li>- Give p.pt presentation. And Criticize his/her work.</li> <li>- Think critically to solve the problem may be faced during the work, Use the Internet for preparing scientific researches.</li> <li>- Write a report about the steps that implemented in the laboratory.</li> </ul>
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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Dental Anatomy and Morphology 1st Edition by Hilton Riquieri 2019</li> <li>• Textbook of Oral Anatomy, Physiology, Histology and Tooth Morphology by K. Rajkumar Kindle Edition 2011</li> <li>• Textbook of Dental Anatomy, Physiology &amp; Occlusion by Rashmi GS (Phulari) DOI: 10.5005/jp/books/11986</li> <li>• 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 the middle southern United States. JFSCA, 35:859-872</li> <li>• Hershkovitz J, Moskona D, Arensberg B and E Kobylansky (1987) Directional dental asymmetry in South Sinai Bedouin isolates. Anthropol. Anz. 45: 269-274.</li> <li>• Garn SM, Smith BH and RE Moyers (1981) Structured (patterned) dimensional and developmental dental asymmetry. Proc. Finn. Dent. Soc. 77:33-36.</li> <li>• Dental Anatomy, its Relevance to Dentistry, Eighth edition.</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Lecture-based, Group interaction and discussion, self-directed activities, active participation, Laboratory experiments.....etc.
<b>Course Objectives:</b>	<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Acquire basic skills in Carving of crowns of permanent teeth in wax.</li> <li>• Expected to appreciate the normal development, morphology, structure &amp; functions of oral tissues &amp; variations in different Pathological/non p pathological states.</li> <li>• Know the basic knowledge of various research methodologies</li> </ul>
<b>Course Assessments</b>	<p>Activities 10%                      Midterm exam 20 %  Attendances 10%                  Final Exam        60%  A 60% is required for a pass in this course.</p>
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Tooth Description..
<b>Session 2 (Week 2)</b>	Dental terminology...
<b>Session 3 (Week 3)</b>	Tooth numbering systems (Different system) (Dental formula).
<b>Session 4 (Week 4)</b>	Anatomical Structure (Landmarks)
<b>Session 5 (Week 5)</b>	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
<b>Session 6 (Week 6)</b>	Morphology of permanent maxillary incisors
<b>Session 7 (Week 7)</b>	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)	<b>Midterm Exam</b>
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)	<b>Final Exam</b>
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

<b>Brief Description:</b>	This course is designed to the undergraduate students at the 3 <sup>rd</sup> 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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Phillips' Science of Dental Materials by hiayi Shen, H. Ralph Rawls, Josephine Esquivel-Upshaw 13th Edition - May 13, 2021</li> <li>• McCracken's Removable Partial Prosthodontics by Alan Carr, David Brown 13th Edition - November 3, 2015</li> <li>• <a href="http://www-personal.umich.edu/~sbayne/dental-materials/RPD- - Acrylic-HO.pdf">http://www-personal.umich.edu/~sbayne/dental-materials/RPD- - Acrylic-HO.pdf</a></li> <li>• (<a href="http://www.fotosearch.com/photos_images/dentures.html">http://www.fotosearch.com/photos_images/dentures.html</a>).</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	6 * 28 = 168 teaching hours
<b>Delivery</b>	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.
<b>Course Objectives:</b>	<p>Upon completion of this course, the students should have the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the concept of occlusion and how to use it in complete denture and how to repair it.</li> <li>• Identify the different parts of complete denture.</li> <li>• Identify representations, terms, conditions.</li> </ul>





	<ul style="list-style-type: none"> <li>• Clarify the importance of provisional denture and the techniques used to fabricate complete denture.</li> <li>• Recognize the different techniques and methods for repairing , repasing, reline and duplication of complete denture.</li> <li>• Distinguish the indications to the various complete denture.</li> <li>• Understand various processing steps used during fabrication of complete denture.</li> <li>• Identify basic principles of tooth selection and arrangement.</li> <li>• Write a report about the steps that implemented in the laboratory.</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam        60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	Introduction of complete denture
<b>Session 2 (Week 2)</b>	Fabrication of special tray
<b>Session 3 (Week 3)</b>	Materials used to fabricate of special tray
<b>Session 4 (Week 4)</b>	Impression and types of it.
<b>Session 5 (Week 5)</b>	Impression materials
<b>Session 6 (Week 6)</b>	- Relief
<b>Session 7 (Week 7)</b>	- Posterior palatal seal (post-dam)
<b>Session 8 (Week 8)</b>	- Face bow
<b>Session 9 (Week 9)</b>	-Articulator
<b>Session 10 (Week 10)</b>	-classification of articulator
<b>Session 11 (Week 11)</b>	- record base
<b>Session 12 (Week 12)</b>	- Occlusal block
<b>Session 14 (Week 13)</b>	Teeth selection
<b>Session 14 (Week 14)</b>	<b>Midterm Exam</b>
<b>Session 15 (Week 15)</b>	Setting of upper anterior teeth-
<b>Session 16 (Week 16)</b>	-Setting of lower anterior teeth
<b>Session 17 (Week 17)</b>	-Setting of upper posterior teeth.
<b>Session 18 (Week 18)</b>	-Types of the posterior teeth
<b>Session 19 (Week 19)</b>	-Wax up
<b>Session 20 (Week 20)</b>	Flasking •
<b>Session 21 (Week 21)</b>	- Finishing of final stage
<b>Session 22 (Week 22)</b>	-polishing of final stage
<b>Session 23 ( week 23)</b>	Topics to be covered in the session (week) - Complete denture error
<b>Session 24 ( week 24)</b>	- Repair
<b>Session 25 ( week 25)</b>	- Rebase





<b>Session 26 ( week 26)</b>	- Reline
<b>Session 27 ( week 27)</b>	- Duplication of denture
<b>Session 28 ( week 28)</b>	- Students Presentations
<b>Session 29 ( week 29)</b>	Revision and discussion
<b>Session 30 (Week 31)</b>	<b>Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	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.
<b>Course Change</b>	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)

<b>1</b>	<b>Course name</b>	<b>Fixed Prosthodontics I (Crowns and Bridges)</b>
<b>2</b>	<b>Course Code</b>	DT304
<b>3</b>	<b>Course type: /general/specialty/optional</b>	Specialty
<b>4</b>	<b>Accredited units</b>	4
<b>5</b>	<b>Educational hours</b>	6 hours per week
<b>6</b>	<b>Pre-requisite requirements</b>	Non
<b>7</b>	<b>Program offered the course</b>	Dental Technology Prog.
<b>8</b>	<b>Instruction Language</b>	English
<b>9</b>	<b>Date of course approval</b>	2022

#### Brief Description:

This course is designed to the undergraduate students at the 3<sup>rd</sup> 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.









<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li>● Conventional fixed prosthesis.</li> <li>● Materials used for fixed restoration</li> <li>● Techniques used for constructing fixed prosthesis.</li> <li>● Steps in construction of cast restorations.</li> <li>● Types of fixed restorations and their classifications.</li> <li>● Contra-indications of partial coverage restorations.</li> </ul> <p>Assignment 2 handed out</p>
<b>Session 3 (Week 3)</b>	<ul style="list-style-type: none"> <li>● Conventional fixed prosthesis II</li> <li>● Fixed partial denture.</li> <li>● A primary abutments.</li> <li>● An intermediate abutments</li> <li>● Classification of fixed partial denture.</li> <li>● According to retention</li> <li>● Advantages, disadvantages, Indication, and contra-indication for different types of bridges.</li> </ul>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>● Conventional fixed prosthesis III</li> <li>● Classification of FPD :</li> <li>● According to materials</li> <li>● According to location</li> </ul>
<b>Session 5 (Week 5)</b>	<ul style="list-style-type: none"> <li>• Principles of tooth preparation.</li> <li>• Definition of tooth preparation and prepared teeth.</li> <li>• Purpose of tooth preparation.</li> <li>• Biomechanical principles of tooth preparation for a cast metal or porcelain restorations. <ul style="list-style-type: none"> <li>1- Preservation of tooth structure.</li> <li>The results of excessive reduction of tooth structure during tooth preparation.</li> </ul> </li> </ul>
<b>Session 6 (Week 6)</b>	<ul style="list-style-type: none"> <li>• Biomechanical principles of tooth preparation for a cast metal or porcelain restorations: <ul style="list-style-type: none"> <li>2- Retention and resistance from. <ul style="list-style-type: none"> <li>• Path of insertion</li> </ul> </li> <li>• Factors affecting the resistance form <ul style="list-style-type: none"> <li>i. Taper</li> <li>ii. Surface area <ul style="list-style-type: none"> <li>• Factors affecting surface area</li> </ul> </li> <li>iii. Length and height.</li> <li>iv. Texture of preparation.</li> <li>v. Accessory means</li> </ul> </li> </ul> </li> </ul>
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>3. Structural Durability (Preventing Deformation)</li> <li>• Preparation Features Related to Structural Durability: <ul style="list-style-type: none"> <li>a- Occlusion reduction.</li> <li>b- Axial reduction.</li> </ul> </li> </ul>





	<ul style="list-style-type: none"> <li>c- Functional cusp bevel.</li> <li>• Inadequate functional cusp bevel may produce several problems.</li> </ul> <p>4. Preservation of Periodontal Tissue.</p> <ul style="list-style-type: none"> <li>• Finish line.</li> <li>• Requirement of finish line.</li> <li>• Classification of finish line according to location</li> </ul>
<b>Session 8 (Week 8)</b>	<p>5 - Marginal Integrity.</p> <ul style="list-style-type: none"> <li>• The Requirements of Restoration Margins</li> <li>• Types of finish lines</li> <li>• Chamfer finish line</li> <li>• Knife edge finish-line.</li> <li>• Shoulder finish line.</li> <li>• Shoulder with bevel.</li> <li>• Chamfer with bevel.</li> <li>• Advantages, disadvantages of each type.</li> </ul>
<b>Session 9 (Week 9)</b>	PBL Assessment (Project Based Learning)
<b>Session 10 (Week 10)</b>	<ul style="list-style-type: none"> <li>• Working (Master) Cast</li> <li>• Requirements of good Cast.</li> <li>• Before pouring the cast.</li> <li>• Pouring the cast.</li> <li>• Separating, Trimming, and Storing Casts.</li> </ul>
<b>Session 11 (Week 11)</b>	<ul style="list-style-type: none"> <li>• Provisional (Interim) Restoration.</li> <li>• Requirements of Provisional Restoration.</li> </ul>
<b>Session 12 (Week 12)</b>	<ul style="list-style-type: none"> <li>• Types of temporary crowns.</li> <li>• Techniques used for fabricating custom temporary restoration.</li> <li>• Advantages of indirect over direct technique</li> <li>• Cementing of the Temporary Crown or Bridge</li> </ul>
<b>Session 13(Week 13)</b>	<ul style="list-style-type: none"> <li>• Methods of Fabricating Custom Provisional Restoration.</li> <li>1. Vacuum-Forming Methods.</li> <li>2. Alternative Methods. <ul style="list-style-type: none"> <li>a. Alginate Impression Template Method.</li> <li>b. Silicone Template Method</li> </ul> </li> </ul>
<b>Session 14 (Week 14)</b>	<ul style="list-style-type: none"> <li>• The Die:</li> <li>• Ideal requirements of die</li> <li>• Requirements of die materials.</li> <li>• Types of die according to material used. <ol style="list-style-type: none"> <li>1. Gypsum products.</li> <li>2. Resin dies or epoxy dies.</li> <li>3. Amalgam dies.</li> <li>4. Refractory die.</li> <li>5. Electroplated die.</li> </ol> </li> </ul>






	<p>I. Silver-plated die.  II. Copper-plated die.</p> <p>1. Gypsum products die.</p> <ul style="list-style-type: none"> <li>• Types of dental gypsum products</li> <li>• Advantages and disadvantages of gypsum products</li> </ul>
<b>Session 15 (Week 15)</b>	<b>Midterm exam</b>
	<ul style="list-style-type: none"> <li>• Properties of Gypsum Products.</li> </ul> <p>a. Strength:</p> <ol style="list-style-type: none"> <li>Crush strength</li> <li>Wet strength</li> <li>Dry strength.</li> </ol> <p>b. Setting time.</p> <ol style="list-style-type: none"> <li>Initial sitting time</li> <li>Final sitting time.</li> </ol> <p>c. Setting expansion.</p> <ol style="list-style-type: none"> <li>Normal sitting expansion.</li> <li>Hygroscopic sitting expansion.</li> <li>Thermal sitting expansion.</li> </ol>
<b>Session16(Week16-18)</b>	<ul style="list-style-type: none"> <li>• Effect of Selected Variables on Crushing Strength. <ol style="list-style-type: none"> <li>Water-powder ratio</li> <li>Mechanical mixing.</li> <li>Chemical modifiers.</li> </ol> </li> <li>• Effect of Selected Variables on Setting Time. <ol style="list-style-type: none"> <li>Water –powder ratio.</li> <li>Water temperature.</li> <li>Mixing.</li> </ol> </li> <li>• Accelerator and retarders.</li> <li>• Effect of Water-Powder Ratio and Mixing Time on Setting Expansion</li> </ul>
<b>Session17(Week 19-20)</b>	<ol style="list-style-type: none"> <li>Resin dies or epoxy dies. <ul style="list-style-type: none"> <li>• Advantages and disadvantages</li> </ul> </li> <li>Amalgam dies. <ul style="list-style-type: none"> <li>• Advantages and disadvantages</li> </ul> </li> <li>Refractory die.</li> <li>Electroplated die. <ul style="list-style-type: none"> <li>• Advantages and disadvantages.</li> </ul> </li> <li>The Working Cast &amp; Die Systems. <ol style="list-style-type: none"> <li>Working cast with separated die. <ul style="list-style-type: none"> <li>○ Advantages.</li> <li>○ Disadvantages.</li> <li>○ Procedures.</li> </ul> </li> <li>Working cast with removable die.</li> </ol> </li> </ol>





<p><b>Session18(Week 21-22)</b></p>	<p>2. Working Cast with a Removable Die.</p> <ul style="list-style-type: none"> <li>○ The Main Requirement of Working Cast with a Removable Die.</li> <li>○ Advantages.</li> <li>○ Disadvantages.</li> <li>● Techniques of Removable Die. <ul style="list-style-type: none"> <li>1- Dowel pin Technique. <ul style="list-style-type: none"> <li>a- Single Dowel (Flat or Curved Single dowel pin).</li> <li>b- Double Dowel.</li> </ul> </li> <li>2- Pindex System.</li> <li>3- Di-lock Technique.</li> </ul> </li> <li>● Steps of fabrication.</li> </ul>
<p><b>Session 19(Week 23 -24)</b></p>	<ul style="list-style-type: none"> <li>● Wax pattern <ul style="list-style-type: none"> <li>○ Requirement of casting wax.</li> </ul> </li> <li>● Techniques of a wax pattern.</li> <li>● Types of Waxes that used for Wax Pattern. <ul style="list-style-type: none"> <li>1- Type I waxes: are formulated for making intraoral (inlay) wax patterns.</li> <li>2- 1- Type II waxes: are formulated for making wax pattern indirectly.</li> </ul> </li> <li>● Methods of Wax Pattern Construction. <ul style="list-style-type: none"> <li>1. Dipping Method.</li> <li>2. Addition Method.</li> <li>3. Molten Press Method.</li> <li>4. Injection Method.</li> </ul> </li> </ul>
<p><b>Session 20 (Week 25-26)</b></p>	<ul style="list-style-type: none"> <li>● Die or Cast preparation Before Wax Pattern <ul style="list-style-type: none"> <li>○ Trimming the Die.</li> <li>○ Shaping the die Handle.</li> <li>○ Correction of Defects.</li> <li>○ Marking the Margin.</li> <li>○ Paint on the Die Spacer.</li> </ul> </li> </ul> 
<p><b>Session 21(Week 27-28)</b></p>	<ul style="list-style-type: none"> <li>● Waxing Instruments <ul style="list-style-type: none"> <li>○ No 1: wax large addition instruments</li> <li>○ No 2: wax lesser addition instruments.</li> <li>○ No 3: burnisher for refining occlusal anatomy.</li> <li>○ No 4: wax carvers</li> <li>○ No 5: wax carvers.</li> <li>○ No 6: wax burnisher.</li> <li>○ No 7: waxing spatula for fundamental layer.</li> </ul> </li> <li>● Steps of Waxing a Pattern.</li> <li>● The techniques for occlusal and axial contouring of wax patterns are:</li> </ul>



	<ol style="list-style-type: none"> <li>1. Negative waxing, which is the buildup, smash, and carve technique.</li> <li>2. Positive waxing, which consists of adding wax to a wax blank</li> </ol>
<b>Session 22 (Week 28)</b>	<b>Practical final exam</b>
<b>Session 23 (Week 29-32)</b>	<b>Theoretical and oral Final Exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	<p>By the end of the course, the student be able to:</p> <ul style="list-style-type: none"> <li>- Communicate effectively with colleagues.</li> <li>- Work in group (team work).</li> <li>- Time management.</li> <li>- Give p.pt presentation.</li> <li>- Implement of dental laboratory instruments and devices.</li> <li>- Write a report about the steps that implemented in the laboratory.</li> <li>- Use the Internet for preparing scientific researches.</li> <li>- Criticize his/her work.</li> <li>- Think critically to solve the problem may be faced during the work.</li> </ul>
<b>Course Change</b>	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
<b>Brief Description:</b>		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.
<b>Textbooks required for this Course:</b>		<ul style="list-style-type: none"> <li>• Oral pathology for the dental hygienist, fourth edition, ibsen, phelan. united state of America, 2004.</li> <li>• Shafer's Textbook of Oral Pathology, 6/e by B Sivapathasundharam, Arya Rajendran 6th Edition - July 15, 2009</li> <li>• Textbook of Oral Pathology by Anil Govindrao Ghom 2nd Edition 2013.</li> <li>• A Textbook of Oral Pathology by William G. Shafer BS DDS MS (1983-01-01)</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>		4 * 28 = 112 teaching hours
<b>Delivery</b>		Lecture-based, Group interaction and discussion, self-directed activities, project based learning (PBL), videos, active participation, Laboratory experiments.
<b>Course Objectives:</b>		<p>Upon completion of this course, the student will have reliably demonstrated the ability to:</p> <ul style="list-style-type: none"> <li>• Understand the stages of disease formation, its nature and causes</li> <li>• Identify the students on the most important diseases the effect the oral tissue</li> <li>• Recognize the types of dental caries.</li> <li>• Identify representations, terms, conditions that used in oral pathology</li> </ul>





	<ul style="list-style-type: none"> <li>Recognize different abnormality of the teeth.</li> <li>Write the stages of plaque formation.</li> <li>Implement a diagnoses about the disease by using special instruments.</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam        60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>Introduction to principle of pathology</li> <li>Types of the cells</li> <li>Cellular adaptations to stress</li> </ul> Overview of cell injury and cell death <ul style="list-style-type: none"> <li>Causes of cell injury</li> </ul>
<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li>Inflammation</li> <li>Causes of inflammation</li> <li>Types of inflammation</li> <li>Acute inflammation</li> <li>Chronic inflammation</li> <li>complications</li> </ul> Assignment 2 handed out
<b>Session 3 (Week 3)</b>	Repair Definition Factors affecting repair Local factors General factors <ul style="list-style-type: none"> <li>Types of repairs</li> </ul>
<b>Session 4 (Week 4)</b>	Cell response to injury Causes of cell injury Mechanism of cell injury Effects of cell injury <ul style="list-style-type: none"> <li>Pathological features</li> </ul>
<b>Session 5 (Week 5)</b>	Necrosis Definition Causes and pathogenesis Types of necrosis
<b>Session 6 (Week 6)</b>	Apoptosis Definition Morphological changes Occurrence
<b>Session 7 (Week 7)</b>	<ul style="list-style-type: none"> <li>Infectious diseases</li> <li>Bacterial infections</li> <li>Definition</li> <li>Mode of infection</li> <li>Exogenous infection</li> <li>Endogenous infection</li> </ul>
<b>Session 8 (Week 8)</b>	<ul style="list-style-type: none"> <li>Fungal infections</li> <li>Viral infections</li> </ul>





	<p>Mode of infection</p> <p>Mechanisms of cell injury by viruses</p> <ul style="list-style-type: none"> <li>• Pathological changes</li> </ul>
<b>Session 9 (Week 9)</b>	<b>PBL assessment (project based learning)</b>
<b>Session 10 (Week 10)</b>	<b>Midterm Exam</b>
<b>Session 11 (Week 11)</b>	<p>Disturbances of growth</p> <p>Atrophy</p> <p>Hypertrophy</p> <p>Hyperplasia</p> <p>Metaplasia</p> <ul style="list-style-type: none"> <li>• Dysplasia</li> </ul>
<b>Session 12 (Week 12)</b>	<p>Tumours</p> <p>Definition</p> <p>General characters of tumours</p> <p>Benign tumours</p> <ul style="list-style-type: none"> <li>• Malignant tumours</li> </ul>
<b>Session 13 (Week 13)</b>	<ul style="list-style-type: none"> <li>• dental caries</li> <li>• definition of dental caries</li> </ul> <p>Theories for dental caries</p> <p>Hypothesis for etiology of dental caries</p> <ul style="list-style-type: none"> <li>• Role of saliva</li> </ul>
<b>Session 14 (Week 14)</b>	<ul style="list-style-type: none"> <li>• Classification of dental caries</li> <li>• G.V. BLACK</li> </ul> <p>Who system</p>
<b>Session 15 (Week 15)</b>	<ul style="list-style-type: none"> <li>• dental plaque</li> <li>• Definition of Dental plaque</li> </ul> <p>Bacterial Lifestyles</p> <ul style="list-style-type: none"> <li>• Formation of Dental Plaque Biofilm</li> </ul>
<b>Session 16 (Week 16)</b>	<b>Midterm practical Exam</b>
<b>Session 17 (Week 17)</b>	<ul style="list-style-type: none"> <li>• GINGIVITIS</li> </ul> <p>Clinical Features</p> <p>Gingival Bleeding</p> <p>iv. Histopathological changes associated with gingivitis</p>
<b>Session 18 (Week 18)</b>	<ul style="list-style-type: none"> <li>• PERIODONTITIS</li> <li>• Factors involved in the severity of periodontitis</li> </ul> <p>Classification of periodontitis</p> <ul style="list-style-type: none"> <li>• Periodontitis Association With Endodontic Lesion</li> </ul>
<b>Session 19 (Week 19)</b>	<p>abnormalities of teeth</p> <p>Alterations in shape</p> <p>Gemination</p> <p>Fusion</p> <p>Concrescence</p> <p>Dilacerations</p> <p>Dens invaginatus</p>
<b>Session 20 (Week 20)</b>	<p>abnormalities of teeth</p> <p>Alterations in shape</p>





	<p>Dens evaginatus  Taurodontism  Supernumerary roots  Enamel pearls  Attrition  Abrasion</p> <ul style="list-style-type: none"> <li>● Erosion</li> </ul>
<b>Session 21 (Week 21)</b>	<p>abnormalities of teeth  Alterations in size  microdontia</p> <p style="text-align: right;">5. macrodontia</p>
<b>Session 22 (Week 22)</b>	<p>abnormalities of teeth  Alterations in number  Anodontia  Impaction</p> <ul style="list-style-type: none"> <li>○ Supernumerary teeth</li> </ul>
<b>Session 23 (Week 23)</b>	<p>Pulp calcification  Abnormalities of dental pulp  Internal resorption  External resorption</p>
<b>Session 24 (Week 24)</b>	<p>Neoplasia  Objectives  description  Causes of neoplasia</p>
<b>Session 25 (Week 25)</b>	<p>Immunity  Objectives  Immune response  Antigens  Cells involved in the immune response</p>
<b>Session 26 (Week 26)</b>	<p>Diseases affecting the temporomandibular joint  Anatomy of the tempromandibular joint  Normal joint function  Temporomandibular disorders</p>
<b>Session 27 (Week 27)</b>	<p>histopathological techniques  steps of histopathology  Tissue processing  Microtomy  Types of microtomes</p>
<b>Session 28 (Week 28)</b>	Revision and discussion
<b>Session 28 (Week 29)</b>	<b>Practical final exam</b>
<b>Session29(Week30-32)</b>	<b>Theoretical and oral final exam</b>
<b>Attendance Expectations</b>	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.
<b>Generic Skills</b>	By the end of the course, the student be able to: <ul style="list-style-type: none"> <li>- Communicate effectively with colleagues.</li> </ul>





	<ul style="list-style-type: none"> <li>- Work in group (team work).</li> <li>- Time management.</li> <li>- Give p.pt presentation.</li> <li>- Implement of dental laboratory instruments and devices.</li> <li>- Write a report about the steps that implemented in the laboratory.</li> <li>- Use the Internet for preparing scientific researches.</li> </ul> <p>Criticize his/her work. Think critically to solve the problem may be faced during the work.</p>
<b>Course Change</b>	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

<b>Brief Description:</b>	This course is designed to the undergraduate students at the 3 <sup>rd</sup> 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.
<b>Textbooks required for this Course:</b>	<ul style="list-style-type: none"> <li>• Oral microbiology by Philip D Marsh &amp; Micheal V Martin</li> <li>• Oral Microbiology by Philip Marsh, Michael Lewis, Helen Rogers, David Williams, Melanie Wilson 6th Edition - May 13, 2016</li> <li>• Clinical Oral Microbiology by T. Wallace MacFarlane and Lakshman P. Samaranayake 1989.</li> </ul>



	<ul style="list-style-type: none"> <li>• Brock Biology of Microorganisms by Michael T. Madigan, Kelly S. Bender, Daniel H. Buckley, W. Matthew Sattley and David A. Stahl 15<sup>th</sup> edition 2018</li> <li>• Additional textbooks, handouts, and web links may be used in this course at the discretion of your instructor.</li> </ul>
<b>Course Duration</b>	4 * 28 = 112 teaching hours
<b>Delivery</b>	Presentation's Lectures, small discussion Groups, seminars, project based learning (PBL), videos, practical (laboratory).
<b>Course Objectives:</b>	<p>Upon completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li>• Appreciate the diversity and complex microbial interactions within the oral microbiome and understand how the oral microbiota is shaped.</li> <li>• Understand the major characteristics of supragingival and subgingival biofilms.</li> <li>• Understand the innate and adaptive immune responses in the oral cavity.</li> <li>• Understand the mechanisms utilized by bacteria to colonize the different niches in the oral cavity.</li> <li>• Identify and describe the major characteristics of bacterial, fungal and viral pathogens associated with disease.</li> <li>• Recognize the multifactorial aspects of dental caries and periodontitis.</li> <li>• Recognize the possible associations of oral bacteria with systemic infections and cancer.</li> <li>• 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..</li> </ul>
<b>Course Assessments</b>	Activities 10%                      Midterm exam 20 % Attendances 10%                  Final Exam 60% A 60% is required for a pass in this course.
<b>Content Breakdown</b>	<b>Topics Coverage</b>
<b>Session 1 (Week 1)</b>	<ul style="list-style-type: none"> <li>• Introduction to general microbiology.</li> <li>• Microbes</li> <li>• Key figures in the history of microbiology</li> <li>• Types of Cells.</li> <li>• Membrane bound organelles are found in eukaryotic cells.</li> </ul>
<b>Session 2 (Week 2)</b>	<ul style="list-style-type: none"> <li>• Transport.</li> <li>• Taxonomy of microbiology .</li> <li>• The Prokaryotes (Kingdom Monera).</li> <li>• The Kingdom Protista.</li> </ul> <p>homework 1 handed out plus quiz 1</p>
<b>Session 3 (Week 3)</b>	<ul style="list-style-type: none"> <li>• The Kingdom Fungi</li> <li>• The Kingdom Plantae .</li> <li>• The Kingdom Animalia.</li> </ul> <p>homework 2 handed out plus quiz 2</p>
<b>Session 4 (Week 4)</b>	<ul style="list-style-type: none"> <li>• Viruses</li> <li>• Growth and culture of bacteria.</li> </ul>






	<ul style="list-style-type: none"> <li>Identifying bacterial species</li> <li>Eukaryotic organisms that cause human disease – parasitic disease</li> </ul> <p>homework 3 handed out plus quiz 3</p>
Session 5 (Week 5)	<ul style="list-style-type: none"> <li>Definition of oral microflora .</li> <li>Microbial habitats.</li> <li>Factors affecting growth of oral microflora.</li> <li>Identification the different types of bacteria in the mouth.</li> <li>Important oral bacteria.</li> </ul> <p>homework 4 handed out plus quiz 4.</p>
Session 6 (Week 6)	<ul style="list-style-type: none"> <li>Clinical examples of microbes in the mouth.</li> <li>Flora in dental plaque.</li> <li>Changes in the oral flora with age .</li> <li>Bacterial endocarditis .</li> </ul> <p>homework 5 handed out plus quiz 5.</p>
Session 7 (Week 7)	<ul style="list-style-type: none"> <li>. Dental plaque</li> <li>Macroscopic Structure and Composition of Dental Plaque:</li> <li>Materia alba.</li> <li>Calculus.</li> <li>Supragingival plaque.</li> <li>Subgingival plaque</li> <li>Organic constituents of the matrix of dental plaque.</li> </ul> <p>homework 6 handed out plus quiz 6.</p>
Session 8 (Week 8)	<p>5 – Dental plaque.</p> <ul style="list-style-type: none"> <li>The Inorganic Component of dental plaque.</li> <li>Formation of Dental Plaque.</li> <li>a) Formation of the pellicle coating on the tooth surface.</li> <li>b) surface.</li> <li>c) Initial colonization by bacteria, and</li> <li>d) Secondary colonization and plaque maturation.</li> </ul> <p>homework 7 handed out plus quiz 7</p>
Session 9 (Week 9)	<b>Revision and discussion</b>
Session 10 (Week 10)	<b>Midterm Exam</b>
Session 11 (Week 11)	<ul style="list-style-type: none"> <li>Host-parasite relationship.</li> <li>Mutualism.</li> <li>Parasitism.</li> <li>Pathogenicity</li> </ul> <p>quiz 8</p>
Session 12 (Week 12 &13)	<ul style="list-style-type: none"> <li>Opportunistic pathogens.</li> <li>Infection.</li> <li>Virulence</li> <li>Host defenses.</li> <li>Inducible defenses.</li> <li>Antigens</li> <li>Natural antibodies</li> <li>Antimicrobial agents</li> <li>Host factors.</li> </ul>





	homework 9 handed out plus quiz 9
<b>Session 13 (Week 14 &amp;15)</b>	<ul style="list-style-type: none"> <li>• Oral immunity</li> <li>• Homeostasis and Immune System</li> <li>• Language of the Immune System</li> <li>• Key Elements of Immunity</li> <li>• Three Important Characteristics to Adaptive Immunity</li> <li>• Immunogens and Antigens.</li> </ul> homework 10 handed out plus quiz 10
<b>Session 14 (Week 16 &amp; 17)</b>	<ul style="list-style-type: none"> <li>• Five Classes [subclasses] of</li> <li>• Immunoglobulins</li> <li>• Blood Leukocytes</li> <li>• Granulocytes</li> <li>• Monocytes - Macrophages</li> <li>• Lymphocytes</li> <li>• Maturity of T and B Cells.</li> </ul> homework 11 handed out plus quiz 11
<b>Session 15 (Week 18)</b>	<b>Midterm practical exam</b>
<b>Session 16 (Week 19)</b>	<ul style="list-style-type: none"> <li>• Types of Hypersensitivity Reactions</li> <li>• Progression of the Inflammatory Periodontal Lesion</li> <li>• Initial Lesion (2-4 days)</li> <li>• Early Lesion (4-7 days)</li> </ul>
<b>Session 17 (Week 20)</b>	Topics to be covered in the session (week). <ul style="list-style-type: none"> <li>• Infectious Diseases.</li> </ul> Bacterial Infections <ol style="list-style-type: none"> <li>1. Impetigo</li> <li>2. Tonsillitis and Pharyngitis</li> <li>3. Tuberculosis</li> <li>4. Actinomycosis</li> <li>5. Syphilis</li> </ol> 
<b>Session 18 (Week 21)</b>	Infectious Diseases. <ul style="list-style-type: none"> <li>• Bacterial Infections</li> </ul> <ol style="list-style-type: none"> <li>6. Necrotizing Ulcerative Gingivitis</li> <li>7. Pericoronitis</li> <li>8. Acute Osteomyelitis</li> <li>9. Chronic Osteomyelitis</li> </ol>
<b>Session 19 (Week 22)</b>	Topics to be covered in the session (week). <ul style="list-style-type: none"> <li>• Infectious Diseases.</li> </ul> Fungal Infections <ol style="list-style-type: none"> <li>1. Candidiasis</li> <li>2. Deep fungal infections</li> <li>3. Mucormycosis- Double Dowel.</li> </ol>
<b>Session 20 (Week 23)</b>	Topics to be covered in the session (week). <ul style="list-style-type: none"> <li>• Infectious Diseases</li> </ul> Viral Infections. <ol style="list-style-type: none"> <li>1. Human Papillomavirus Infection</li> </ol>