لائحة الدراسات العليا بنظام الساعات المعتمدة
لمعهد البحوث الطبية جامعة الاسكندرية

قرار وزاري رقم ٢٥٨ بتاريخ ٢٠١٧/١/٨

الفهـــــــــرس

مقدمـــــة

يتسم العصر الحالى بالتطور العلمى الهائل والتقدم التكنولوجى المتسارع فى شتى مجالات الحياة، وحرصاً من إدارة معهد البحوث الطبية على الإسهام فى الارتقاء بالمستوى العلمى والتعليمى بجمهورية مصر العربية قام المعهد بتطوير برنامجه للدراسات العليا والبحوث ليواكب هذا التطور و يعمل على تقوية الخبرات العلمية والبحثية والإكلينيكية لخريجى الجامعات المصرية و العربية بما يضمن تلبية احتياجات سوق العمل الفعلية من المتخصصين ذوى المستوى الرفيع.

أهـداف المعهد

- البحث العلمى المنسق فى مختلف فروع الطب بين أقسام المعهد الأكاديمية و الإكلينيك ية و مختلف الكليات العملية بالجامعات المصرية، و العربية، و العالمية.
- زيادة قدرات الدارس التحصيلية وتنمية المهارات العقلية والعلمية.
- تنمية مهارات التحليل والنقد والقدرات الابتكاري ة والتعرف على المشاكل وحلها و تكوين اتجاهات إيجابية لدى المتعلمين نحو القضايا التعليمية والبيئية واحترام أخلاقيات المهنة الطبية وقوانينها وذلك لإعداد خريج ذو شخصية متكاملة ومستوى علمى عالى الجودة بمقاييس علمية معترف بها يستطيع المنافسة فى سوق العمل والقيام بدور قيادى فعال فى الاهتمام بالصحة وحل المشاكل الصحية المختلفة المرتبطة بمحافظة الإسكندرية والمجتمع المحيط من قرى ومدن.

تطور إنشاء معهد البحوث الطبية

- قرار رئيس الجمهورية بالقانون رقم ٣ لسنة ١٩٥٧ فى شأن إنشاء معهد طبى بمدينة الإسكندرية يطلق عليه اسم "المعهد الطبى " يكون هيئة مستقلة لها الشخصية الإعتبارية، و يلحق بالمجلس الدائم للخدمات العامة.
- قرار رئيس الجمهورية العربية المتحدة رقم ١١٠ لسنة ١٩٦١ فى شأن إلحاق المعهد الطبى بمدينة الإسكندرية بالمركز القومى للبحوث و يعتبر معهداً فنياً للبحوث الطبية و التدريب الطبى.
- قرار رئيس مجلس الوزراء رقم ١٨٧١ لسنة ١٩٧١ بشأن تبعية معاهد البحوث المتخصصة التى كانت تابعة لوزارة البحث العلمى بتبعية المعهد الطبى الى جامعة الاسكندرية.
- قرار وزير التعليم العالى رقم ٣١٥ لسنة ١٩٩٦ بتاريخ ١٩٩٦/٣/١٧ بشأن إجراء تعديل على اللائحة الداخلية لمعهد البحوث الطبية بجامعة الإسكندرية لفصل تخصص الباثولوجيا الاكلينيكية وجعله قسماً مستقلاً تحت مسمى قسم الباثولوجيا الكيميائية ولا يعين فى هذا القسم سوى الأطباء البشريين فقط.

و يقوم المعهد بالأتى:

١. البحث العلمى و الإكلينيكى .
٢. تقديم عدة برامج دراسية لطلبة الدراسات العليا فى العلوم الاساسية والطبية ومنح الدرجات العلمية..
٣. تشخيص وعلاج الامراض من خلال المستشفى والعيادة الخارجيةويساهم أيضاً نشاط المستشفى فى القطاع البحثى والتدريسى.
٤. يتعاون المعهد مع مؤسسات المجتمع المختلفة فى تنفيذ مشاريع طبية وبحثية لخدمة المجتمع.
٥. تدريب الأطباء على التعمق فى دراسة و بحث وسائل تشخيص و علاج الأمراض الهامة.

ويتكون المعهد من :-

١- الأقسام الأكاديمية و الإكلينيكية.

٢- مستشفى المعهد ومركز نقل الدم.

أقسام المعهد الأكاديمية و الاكلينيكية

CODE **	DEPARTMENT	القسم*
1701	BIOCHEMISTRY	الكيمياء الحيوية
1702	APPLIED MEDICAL CHEMISTRY	الكيمياء الطبية التطبيقية
1703	HUMAN PHYSIOLOGY	فسيولوجيا الإنسان
1704	PHARMACOLOGY	الاقربازين
1705	HAEMATOLOGY	أمراض الدم
1706	MICROBIOLOGY	الأحياء الدقيقة
1707	PARASITOLOGY	الطفيليات
1708	IMMUNOLOGY AND ALLERGY	المناعة و الحساسية
1709	HISTOCHEMISTRY AND CELL BIOLOGY	كيمياء وبيولوجيا الخلايا والأنسجة.
1710	PATHOLOGY	الباثولوجيا
1711	RADIATION SCIENCES	علوم الإشعاع
1712	MEDICAL BIOPHYSICS	الفيزياء (الطبيعة) الحيوية الطبية
1713	HUMAN GENETICS	الوراثة الإنسانية
1714	EXPERIMENTAL AND CLINICAL SURGERY	الجراحة التجريبية و الإكلينيكية
1715	EXPERIMENTAL AND CLINICAL INTERNAL MEDICINE	الأمراض الباطنة التجريبية و الإكلينيكية
1716	ANESTHESIA	التخدير
1717	CHEMICAL PATHOLOGY	الباثولوجيا الكيميائية
1718	RADIODIAGNOSIS	الأشعة التشخيصية
1719	CANCER MANAGEMENT AND RESEARCH	علاج و أبحاث الأورام
1720	BIOMEDICAL ENGINEERING	الهندسة الحيوية الطبية
1721	BIOMEDICAL INFORMATICS AND MEDICAL STATISTICS	المعلوماتية الحيوية الطبيةو الإحصاء الطبي
1722	MOLECULAR BIOMEDICINE	البيولوجيالجزيئية الطبية

*** يجوز إنشاء أقسام جديدة بقرار من المجلس الأعلى للجامعات بناءً على إقتراح مجلس المعهد وموافقة مجلس الجامعة.**

**** عند العرض التفصيلى للدرجات العلمية يُتبَع كود المعهد وكود القسم العلمى المختص بالأرقام : ٦٠٠ للدبلوم، ٧٠٠ للماجستير، ٨٠٠ للدكتوراة، ثم كود المقرر المحدد من الأقسام العلمية المعنية.**

الباب الأول: القواعد الأساسية

مادة (١):

تمنح جامعة الإسكندرية الدبلومات والدرجات العلمية التالية بناءاً على اقتراح مجلس معهد البحوث الطبية:

١ - دبلوم الدراسات العليا التخصصية.

٢ - درجة الماجستير.

٣ - درجة الدكتوراة.

مادة (٢):

مواعيد الدراسة

١. فصل الخريف: يبدأ السبت الثالث من سبتمبر ولمدة ١٥ أسبوع دراسى شامل الامتحانات.

٢. فصل الربيع: يبدأ السبت الثانى من فبراير ولمدة ١٥أسبوع دراسى شامل الامتحانات.

٣. فصل الصيف: يبدأ السبت الأول من يوليو ولمدة ٨ أسابيع دراسية شاملة الامتحانات.

مادة (٣):

نظام الدراسة

يسمح للطالب بالتسجيل فى فصلى الخريف والربيع فى عدد من الساعات لا يزيد عن ١٦ ساعة معتمدة لكل فصل. كما يسمح للطالب التسجيل فى فصل الصيف فى عدد من الساعات لا يزيد عن ٩ ساعات معتمدة. ولا يحتسب ساعات تسجيل الرسالة ضمن هذه الساعات.

مادة (٤):

الساعات المعتمدة

الساعات الدراسية المعتمدة هى وحدة قياس در اسية لتحديد وزن كل مقرر فى الفصل الدراسى الواحد هى تعادل:

١ - ساعة نظرية واحدة فى الأسبوع.

٢ - أو ساعتان تطبيقيتين أو ساعتين من التدريبات المعملية أو الأكلينيكية فى الأسبوع.

٣ - أو أربع ساعات من التدريبات الميدانية فى الأسبوع طوال الفصل الدراسى.

مادة (٥):

الشروط العامة للتسجيل

١. يقبل الطالب الحاصل على درجة البكالوريوس من إحدى الجامعات المعترف بها من المجلس الأعلى للجامعات للدراسة ببرنامج الدراسات العليا إذا إستوفى شروط القبول بكل برنامج.
٢. إستكمال الشروط الخاصة بالقسم (إن وجدت) وأن يحصل على موافقة مجلس القسم المختص ومجلس المعهد.
٣. ان يستوفى الطالب المستندات والنماذج المطلوبة من إدارة الدراسات العليا.
٤. يختار الطالب المقررات المناسبة ويملأ نموذج تسجيل مقررات ويعتمده من المرشد الأكاديمى ورئيس القسم.
٥. التسجيل شرط أساسى لكى يسمح للطالب بالحضور وحساب المقررات الدراسية له.
٦. لا يعتبر الطالب مسجلاً فى أى مقرر الا بعد سداد الرسوم الدراسية خلال المواعيد المقررة.
٧. الطالب الذى لا يقوم بأنهاء إجراءات التسجيل قبل نهاية الأسبوع الثانى من فصلى الخريف و الربيع أو الأسبوع الأول للفصل الصيفى لا يحق له حضور المحاضرات .

مادة (٦):

قواعد دراسة مقرر

١. يقرر مجلس المعهد الحد الأدنى لعدد الطلاب لفتح المقررات الدراسية.
٢. يحق للطالب أن يحذف / يضيف أى مقرر قبل نهاية الأسبوع الثانى من بداية الفصل الدراسى (الخريف – الربيع) أو نهاية الأسبوع الأول من فصل الصيف بعد تعبئة نموذج الحذف والإضافة وإعتماده من المرشد الأكاديمى دون ان يظهر المقرر الذى تم حذفه فى سجله الدراسى.
٣. يسمح للطالب بالإنسحاب من المقرر الدراسى قبل نهاية الأسبوع الثانى عشر من بداية فصلى الربيع والخريف أو الأسبوع السادس من الفصل الصيفى بعد تعبئة نموذج الإنسحاب وإعتماده من المرشد الأكاديمى وفى هذه الحالة لا تحسب للطالب ساعات هذا المقرر ويرصد للطالب تقدير منسحب withdrawal (W) فى سجله الدراسى.
٤. لا يسمح للطالب بدخول الامتحان النهائي إلا إذا حضر ٧٥٪ على الأقل من الساعات التدريسية للمقرر. فإذا تجاوزت نسبة غيابه ٢٥٪ من مجموع عدد الساعات التدريسية للمقرر . يخطر الطالب بحرمانه من دخول امتحان نهاية الفصل ويرصد له في سجله الدراسي منسحبا انسحابا إجباريا من المقرر Forced Withdrawal (FW)
٥. .يحصل الطالب على تقدير غير مكتمل Incompete (I) إذا تعذر عليه دخول الإمتحان النهائى لمقرر أو إتمام بعض متطلباته لأسباب قهرية يقبلها مجلس القسم وتقرها لجنة الدراسات العليا ومجلس المعهد شريطة أن يكون قد حضر وأدى ٧٥٪ على الأقل من متطلبات المقرر، وعليه أداء الإمتحان خلال أسبوعين من بدء الفصل الدراسى التالى، وإلا حصل على تقدير منسحب إجبارى (FW).
٦. المقررات التى يحصل فيها الطالب على تقديرات (FW) أو (W) أو Military withdrawal(MW) أو (I) لا تحسب له كساعات دراسية ولا تدخل فى حساب المتوسط التراكمى للدرجات.
٧. يحق للطالب إعادة التسجيل فى أى مقرر سبق له النجاح أو الرسوب فيه بغرض تحسين تقديره فى هذا المقرر.
٨. يرصد فى سجل الطالب الدراسى Transcript جميع تقديراته الحاصل عليها فى المقررات فى جميع محاولاته وتدخل جميعها فى حساب المتوسط التراكمى للدرجات فى جميع الفصول الدراسية CGPA (Cumulative Grade Point Average) .

٩. يجوز للطالب التسجيل فى مقررات دراسية خارج القسم أو المعهد أو الجامعة ضمن برنامجه الدراسى وذلك بعد موافقة مجلس المعهد بناءاً على إقتراح مجلس القسم المختص وتدخل هذه المقررات فى حساب المتوسط التراكمى للدرجات GPA.

١٠. لا يحسب للطالب المقرر ضمن الساعات المطلوبة للحصول على الدرجة إذا حصل فيه على تقدير أقل من C، ويجب عليه إعادة دراسة المقرر إذا كان اساسياً ويحق للطالب دراسة مقرر بديل إذا كان إختيارياً وتدخل الدرجات الحاصل عليها فى محاولاته فى حساب المتوسط التراكمى للدرجات (CGPA) فى جميع الفصول الدراسية.

١١. فى حالة شطب الطالب من البرنامج لا يحق له التسجيل لنفس البرنامج مرة أخرى فى ذات التخصص.

١٢. لا يحسب للطالب المقرر الذى درسه ومر عليه أكثر من خمس سنوات من تاريخ إجتيازه المقرر وحتى وقت الحصول على الدبلوم أو الماجستير أو سبع سنوات حتى وقت الحصول على الدكتوراه.

١٣. يتم حساب المتوسط التراكمى للدرجات GPA لكل فصل دراسى وال CGPA النهائى وفقاً للأتى:-

(أ) نقاط تقدير المقرر= عدد الساعات المعتمدة للمقرر × نقاط المقرر

(ب) المتوسط التراكمى للدرجات GPA لكل فصل دراسى (لأقرب ثلاثة أرقام عشرية) وفقا للمعادلة:

[نقاط تقدير المقرر ١] + [نقاط تقدير المقرر٢]+

GPA= ―――――――――――――――――

مجموع الساعات المعتمدة لكل المقررات الدراسية التى أكملها الطالب فى الفصل الدراسى

(ج) يتم حساب اجمالى المتوسط التراكمى للدرجات CGPA وفقا للمعادلة:

مجموع نقاط تقدير جميع المقررات التى أكملها الطالب

CGPA= ―――――――――――――――――

مجموع الساعات المعتمدة لكل المقررات الدراسية

Sum of points of credit hours in all courses

CGPA = ---

Sum of number of credit hours of all courses

١٤. يمكن للطالب التسجيل فى مقرر دراسى كمستمع دون دخول الأمتحان ، وفى حالة حضور الطالب ٧٥٪ من الساعات التدريسية أو أكثر يحصل الطالب على تقدير (L). listener مستمع

١٥. لا يسمح للطالب بالتسجيل فى مقرر دراسى إذا كان له متطلب سابق ويجب عليه أن يجتاز المتطلب السابق أولاً..

١٦. يسمح للطالب بالإنسحاب من المقرر الدراسى بعد التسجيل عند إستدعائه لأداء الخدمة العسكرية ويرصد له تقدير منسحب لأداء الخدمة العسكرية (MW) فى سجله الدراسى ولا تحسب هذه الفترة ضمن مدة صلاحية المقررات.

١٧. يرصد تقدير الطالب فى السجل الدراسى In progress (IP) أثناء تقدمه فى بحث رسالة الماجستير او الدكتوراه، وترصد له نتيجة مناقشة الرسالة بتقدير مرضى Satisfactory (S) أو غير مرضى Unsatisfactory (U) ولا تدخل فى حساب متوسط نقاط التقدير GPA.

مادة (٧):

قواعد تقييم المقرر

- يخصص ٦٠٪ من الدرجة للإمتحان النهائى ويخصص باقىالدرجة=٤٠٪ للاختبارت الدورية والتقييم المستمر.
- يكون نظام إحتساب النقاط لكل ساعة دراسية معتمدة كماهو موضح بالجدول

- شروط النجاح:-

١ - يكون الطالب حاصل على (C) على الاقل

٢ - أن يكون حاصل على ٦٠٪ على الاقل من الدرجة المخصصة لنهاية الفصل الدراسى فى كل مادة

٣ - أن يكون حاصل على ٥٠٪ على الاقل من الدرجة المخصصة للامتحان النظرى لكل مقرر فى نهاية الفصل الدراسى

٤ - أن يكون حاصل على ٥٠٪ على الاقل من الدرجة المخصصة للامتحان العملى لكل مقرر فى نهاية الفصل الدراسى

جدول تظام إحتساب النقاط

Point	Grade	
4.000	A	ترصد هذه التقديرات للطلبة الذين أظهروا أداءاً عالياً
3.666	A-	
3.333	B+	Very high graduate caliber
3.000	B	ترصد هذه التقديرات للطلبة الذين أظهروا أداءاً مرضياً
2.666	B-	**Satisfactory Performance**
2.333	C+	
2.000	C	
1.666	C-	ترصد هذه التقديرات للطلبة الذين أظهروا أداءاً أقل من المتوقع منهمً
1.333	D+	**The Performance of the student is less than expected**
1.000	D	يرصد هذا التقدير للطلبة الذين أظهروا أداءاً غير مرض **Unsatisfactory performance**
0.000	F	يرصد للطالب راسب **Fail**
---	W	**Withdrawal** يرصد للطالب المنسحب من مقرر
---	FW	**Forced Withdrawal** يرصد للطالب المنسحب إجبارياً من المقرر
---	I	**Incomplete** يرصد للطالب الذى لم يكمل متطلبات المقرر
---	MW	**Military Withdrawal** يرصد للطالب المنسحب لأداء الخدمة العسكرية
---	L	**Listener** يرصد للطالب المسجل مستمع
---	IP	**In**يرصد للطالب المس جل لساعات الرسالة العلمية ولم تكتمل بعد **progress**
---	S	**Satisfactory** يرصد للطالب عند مناقشة الرسالة العلمية بنجاح
---	U	**Unsatisfactory** يرصد للطالب عند رسوبه فى مناقشة الرسالة العلمية

مادة (٨):

الرسوم الدراسية لبرنامج الدراسات العليا

تحدد فى بداية كل عام دراسى قيمة تسجيل الساعة المعتمدة لبرنامج الدراسات العليا بقرار من رئيس الجامعة بناءاً على موافقة مجلس الجامعة.

مادة (٩):

المرشد الأكاديمى

يحدد القسم لكل طالب مرشداً أكاديمياً ويفضل أن يكون من أعضاء هيئة التدريس من نفس التخصص كلما أمكن، وذلك لتقديم النصح والإرشاد خلال فترة دراسته ولمساعدته فى إختيار المقررات الدراسية الأساسية والتكميلية اللازمة لمجال تخصصه . ويكون ر أى المرشد الأكاديمى إستشارياً وليس إلزامياً للطالب وذلك حتى نهاية دراسة الطالب للمقررات . ويجوز للطالب حرية إختيار المشرف كلما كان ذلك ممكنا ويستبدل المرشد الأكاديمى بالمشرف العلمى لطالب درجتى الماجستير والدكتوراه عند تسجيل الرسالة.

مادة (١٠):

تحويل الساعات المعتمدة

١. بعد موافقة مجلس المعهد وبناءً على اقتراح مجلس القسم يسمح للطالب بتحويل عدد من الساعات المعتمدة سبق له دراستها فى جامعة أخرى على أن تكون من بين متطلبات الحصول على الدرجة و أن يكون قد نجح فيها بتقدير لايقل عن C أو ما يعادله بشرط:
   أ. ألا يزيد مجموع الساعات المحولة عن ٣٠٪ من مجموع الساعات الدراسية اللازمة للحصول على الدرجة.
   ب. ألا تكون قد احتسبت له وحصل بموجب دراستها على شهادة أو درجة علمية أخرى.
   ج. لا تدخل تلك الساعات المعتمدة المحولة من جامعة أخرى فى حساب المتوسط التراكمى للدرجات GPA.
٢. يسمح للطالب المسجل فى أحد برامج الدراسات العليا بجامعة الإسكندرية أن يحول أى عدد من الساعات المعتمدة التى نجح فيها بتقدير C على الأقل أو ما يعادله سبق وأن درسها فى جامعة الإسكندرية فى برنامج التعليم المستمر أو برنامج لم يستكمل إلى أى من برامج الدراسات العليا التى يرغب فى الإلتحاق به ا إذا كانت هذه المقررات من متطلبات البرنامج وتدخل هذه الساعات فى حساب المتوسط التراكمى للدرجات GPA. بشرط ألا يكون قد مر أكثر من خمس سنوات من تاريخ إجتيازه المقرر وحتى حصوله على شهادة الدبلوم أو درجة الماجستير وسبع سنوات حتى حصوله على درجة الدكتوراه.

الباب الثانى
برامج الدراسات العليا

مـادة (١١)

تمنح جامعة الإسكندرية بناءً على اقتراح مجلس معهد البحوث الطبية الشهادات و الدرجات التالية :-

دبلوم الدراسات العليا التخصصى فى:

١- بنك الدم ونقل الدم..... 1- Blood Banking and Blood Transfusion……....

٢- الطفيليات التجريبية و الاكلينيكية..... 2- Experimental and Clinical Parasitology……

٣- المناعة التشخيصية..... 3-Diagnostic Immunology……..

٤- أمراض الحساسية..... 4- Allergy……..…

٥- الفيزياء الحيوية الطبية..... 5- Medical Biophysics……..…

٦- طب القلب الوقائى…… 6-Preventive Cardiology……

٧- طب الألم..... 7- Pain Medicine……...…..…..

٨- المعلوماتية الحيوية الطبية و الاحصاء الطبي..... 8- Biomedical Informatics and Medical Statistics…..

٩- الأخلاقيات الحيوية و الطبية ..... 9-Biomedical Ethics ……..…….

١٠- التصوير الطبي للثدي ..... 10- Breast Imaging ……

١١- الحوكمة الصحية ..... 11- Health Governance …….

درجات الماجستير فى:

1-Biochemistry …….……..	١-الكيمياء الحيوية.....
2- Applied Medical Chemistry……..	٢-الكيمياء الطبية التطبيقية.....
3- Clinical Physiology……..……	٣-الفسيولوجيا الاكلينيكية.....
4- Pharmacology and Experimental Therapeutic……..	٤-الاقربازين والعلاج التجريبى.....
5- Diagnostic and Molecular Microbiology……	٥-الأحياء الدقيقة الجزيئية و التشخيصية.....
6- Applied and Molecular Parasitology……	٦-الطفيليات التطبيقية و الجزيئية.....
7- Immunology and Allergy……..…..	٧-المناعة و الحساسية.....
8- Histochemistry and Cell Biology……..	٨-كيمياء وبيولوجيا الخلايا والانسجة.....
9- Cytopathology and Histopathology…..……..……..….	٩-الفحص الخلوى للسوائل و الأنسجة.....
10-Radiobiology…….……	١٠-بيولوجيا الاشعاع.....
11- Medical Biophysics…….……	١١-الفيزياء الحيوية الطبية.....
12- Human Genetics……..…..	١٢-الوراثة الأنسانية.....
13- Pain Medicine ……	١٣-طب الألم.....
14- Chemical Pathology…….……	١٤-الباثولوجيا الكيميائية.....
15- Experimental Surgery……..	١٥-الجراحة التجريبية.....
16- Biomedical Devices ……..……	١٦-الأجهزة الحيوية الطبية……
17- Biomedical Image Processing ……..….	١٧-معالجة الصور الحيوية الطبية.....
18- Biomedical Informatics and Medical Statistics…….	١٨-المعلوماتية الحيوية الطبية و الاحصاء الطب……
19- Molecular Biomedicine……..…….....	١٩- البيولوجيا الجزيئية الطبية.....
20- Infection Control and Management ……..	٢٠- مكافحة العدوى وعلاجها ……
21- Molecular Epidemiology …….	٢١-الوبائيات الحيوية الجزيئية ……

درجات الدكتوراة فى :

١- الكيمياء الحيوية.....	1-Biochemistry …….……
٢- الكيمياء الطبية التطبيقية.....	2- Applied Medical Chemistry……
٣- الفسيولوجيا الاكلينيكية.....	3- Clinical Physiology……..……
٤- الاقربازين والعلاج التجريبى	4- Pharmacology and Experimental Therapeutics…
٥- طب و باثولوجيا أمراض الدم.....	5- Clinical Haematopathology……
٦- الأحياء الدقيقة الجزيئية و التشخيصية.....	6- Diagnostic and Molecular Microbiology……..…
٧- الطفيليات التطبيقية و الجزيئية.....	7- Applied and Molecular Parasitology……
٨- المناعة و الحساسية.....	8- Immunology and Allergy……..……
٩- كيمياء وبيولوجيا الخلايا والانسجة.....	9- Histochemistry and Cell Biology……
١٠- الفحص الخلوى للسوائل و الأنسجة.....	10- Cytopathology and Histopathology……...
١١- بيولوجيا الاشعاع.....	11-Radiobiology……..……...…
١٢- الفيزياء (الطبيعة) الحيوية الطبية.....	12- Medical Biophysics……..……
١٣- طب الألم.....	13- Pain Medicine ……..…
١٤- الوراثة الإنسانية.....	14- Human Genetics……
١٥- الجراحة التجريبية.....	15- Experimental Surgery……..…
١٦- الباثولوجيا الكيميائية.....	16- Chemical Pathology……..……
١٧- المعلوماتية الحيوية الطبية و الاحصاء الطبي.....	17- Biomedical Informatics and Medical Statistics

الباب الثالث
قواعد الحصول على الدبلوم

مادة (١٢):
شروط التسجيل

يشترط فى تسجيل الطالب لنيل أى من دبلومات الدراسات العليا بالاضافه للشروط الواردة فى مادة (٥):

١. أن يكون حاصلاً على درجة البكالوريوس من إحدى الجامعات أوالمعاهد المعترف بها من المجلس الأعلى للجامعات وفقاً للتخصص المطلوب لكل برنامج.
٢. يجوز لمجلس المعهد بناءاً على توصية مجلس القسم قبول تسجيل الطالب الحاصل على درجة البكالوريوس فى غير التخصص المطلوب التسجيل به بعد إجتيازه بنجاح عدداً من المقررات الدراسية التكميلية التى يحددها مجلس القسم المختص . بحيث لا يتجاوز عدد المقررات التكميلية عن أربعة مقررات بشرط الا تكون مت طلباً سابقاً للمقررات الأساسية وفى حالة زيادتها عن أربعة مقررات يقضى الطالب سنة تأهيلية للنجاح فى هذه المقررات كشرط لتسجيل مقررات الدبلوم ويجب ألا يقل المتوسط التراكمى لتلك المقررات عن C، ولا تحسب له هذه المقررات من ضمن ساعات البرنامج.

مادة (١٣):
الساعات الدراسية للبرنامج

لكى يحصل الطالب على الدبلوم التخصصى يجب أن يدرس ويجتاز بنجاح عدد من الساعات المعتمدة مقدارها ٣٠ ساعة

ويرصد التقدير والمعدل التراكمى للدرجات فى شهادة الدبلوم.

الباب الرابع
قواعد الحصول على درجة الماجستير

مادة (١٤):

شروط التسجيل

يشترط ما يلى فى تسجيل الطالب لدرجة الماجستير بالاضافة للشروط الواردة فى مادة(٥):

١. أن يكون حاصلاً على درجة البكالوريوس وفقاً للتخصص المطلوب لكل برنامج بتقدير عام جيد على الاقل (C^+) أو ما يعادل هذا التقدير من إحدى الجامعات / المعاهد المعترف بها من المجلس الأعلى للجامعات .

٢. يجوز لمجلس المعهد بناءً على اقتراح مجلس القسم المختص قبول تسجيل الطالب الحاصل على درجة البكالوريوس فى غير التخصص المطلوب التسجيل به وذلك بعد اجتيازه عدداً من المقررات الدراسية التكميلية فى مستوى البكالوريوس أو أعلى والتى يراها القسم ضرورية . بحيث لا يتجاوز عدد المقررات التكميلية عن أربعة مقررات بشرط الا تكون متطلباً سابقاً للمقررات الاساسية وفى حالة زيادتها عن أربعة مقررات يقضى الطالب سنة تأهيلية للنجاح فى هذه المقررات كشرط لتسجيل مقررات الماجستير ولا تحسب له هذه المقررات من ضمن ساعات البرنامج.

٣. على الطالب الحاصل على تقدير مقبول فى البكالوريوس ويرغب فى التسجيل لدرجة الماجستير إما الحصول على دبلوم تخصصى بتقدير C^+ على الأقل أو إجتياز مواد تكميلية يحددها المعهد بتقدير لا يقل عن C^+. ويطبق فى حكم المقررات التكميلية حكم المادة ١٢ البند ٢ من هذه الائحة.

٤. يسمح للطالب بالتسجيل فى موضوع الرسالة بعد اجتيازه عدد ١٢ ساعة معتمدة على الأقل مقررات بتقدير CGPA لا يقل عن C^+.

٥. يعرض الطالب خطة البحث فى سيمينار للقسم قبل التقدم بتسجيل موضوع الرسالة وعرضه على مجلس القسم.

٦. الحصول على الرخصة الدولية للحاسب الآلى ICDL وتحديد مستوى اللغة الأجنبية، شرطين لنيل درجة الماجستير وذلك قبل مناقشة الرسالة ووفقاً للقرارات المنظمة الصادرة من مجلس الجامعة.

٧. بعد نجاح الطالب فى جميع المقررات الخاصة بالدرجة بمتوسط تراكمى للدرجات CGPA لا يقل عن C^+ والإنتهاء من موضوع الرسالة يتم عرض تقرير صلاحية الرسالة على مجلس القسم.

٨. تمنح درجة الماجستير بناءً على إقتراح مجلس القسم و موافقة مجلس المعهد للطالب الذى يجتاز مناقشة رسالته العلمية بعد إجتياز جميع المقررات الدراسية المطلوبة للحصول على الدرجة ولا يرصد التقدير أو المعدل التراكمى للدرجات فى شهادة الماجستير.

مادة (١٥):

الساعات الدراسية للبرنامج

١. لكى يحصل الطالب على درجة الماجستير يجب أن يدرس ويجتاز بنجاح عدد ٣٨ ساعة معتمدة بيانها كالآتى:

- ٣٠ ساعة معتمدة مقررات بالإضافة إلى ٨ ساعات معتمدة رسالة علمية.

مادة (١٦):

هيئة الإشراف

١. يقر مجلس المعهد تشكيل لجنة الإشراف على الطالب المسجل لدرجة الماجستير بناءاً على إقتراح مجلس القسم ووفق خطة القسم البحثية من بين الأساتذة أو الأساتذة المساعدين . ويجوز للمدرسين الإشتراك فى الإشراف بحيث لا يزيد عدد المشرفين عن أربعة أعضاء على أن يكون المشرف الرئيسى من المعهد.

٢. فى حالة قيام الطالب ببحث خارج الجامعة يجوز بموافقة مجلس المعهد أن يشترك فى الإشراف أحد المتخصصين حملة درجة الدكتوراه أو من ذوى الخبرة فى مجال التخصص من الجهة التى يجرى فيها البحث.

٣. فى حال سفر أحد المشرفين ولم يمض على إشرافه عام فعلى مجلس المعهد أن يرفع إسمه من لجنة الإشراف بناءاً على إقتراح مجلس القسم ويتم توجية الشكر إليه فى إهداء الرسالة.

٤. فى حالة سفر المشرف على الرسالة بعد مضى عام على التسجيل يقدم سيادته تقريراً علمياً عن مدى تقدم الطالب فى البحث خلال مدة الأشراف على الرسالة موقعاً عليه من باقى المشرفين مع الأحتفاظ بحقة فى نشر نتائج الرسالة. وفى تقرير الصلاحية يكتفى بتقرير المشرف أو المشرفين بالداخل.

٥. يحرر المشرفون على الرسالة تقريراً دورياً عن مدى تقدم الطالب كل ستة أشهر من تاريخ تسجيل خطة البحث. ويتم التوقيع عليه من قبل لجنة الإشراف مجتمعة، وفى حالة إختلاف آراء أعضاء لجنة الإشراف يقوم القسم العلمى بدراسة الحالة وإتخاذ القرار المناسب . تعتمد التقارير من مجلس القسم ولجنة الدراسات العليا بالمعهد ويتم إخطار الطالب عن طريق إدارة الدراسات العليا بالمعهد برأي لجنة الإشراف عن مدى تقدمه فى الرسالة (إستمرار التسجيل أو إنذار الطالب أو إلغاء تسجيل الرسالة).

٦. يلغى تسجيل الطالب من البرنامج إذا حرر له ثلاثة تقارير دورية تفيد بأن أداءه غير مرض وذلك بعد توجيه ثلاثة إنذارات له.

مادة (١٧):

لجنة الحكم

تتقدم لجنة الإشراف على الرسالة بعد الإنتهاء من إعدادها إلى مجلس القسم المختص تمهيداً للعرض على مجلس المعهد بالآتى:

١. تقرير عن صلاحية الرسالة للمناقشة موضح به ما قام به الباحث، ويقوم بالتوقيع عليه جميع المشرفين. كما تقدم لجنة الإشراف إقتراحاً بتشكيل لجنة الحكم على الرسالة . فى حالة سفر أحد المشرفين يرسل المشرف المسافر خطاباً أو فاكس خلال أسبوعين يفيد موافقته على ما جاء فى تقرير الصلاحية . وإذا لم يص ل الرد يطلب منه مرة أخرى إرسال التقرير، وفى حالة عدم ورود موافقته خلال أسبوعين على تقديم تقرير الصلاحية يعتبر ذلك بمثابة الموافقة.

٢. يشكل مجلس المعهد بناءاً على إقتراح مجلس القسم المختص لجنة الحكم على الرسالة من ثلاثة أعضاء احدهما المشرف على الرسالة والعضوان الآخران من بين الأساتذة والأساتذة المساعدين بالجامعات ويكون رئيس اللجنة أقدم الأساتذة وفى حالة تعدد المشرفين يجوز أن يشتركوا فى اللجنة على أن يكون لهم صوت واحد. ويجوز أن يكون العضوان أو أحدهما من الأساتذة السابقين أو ممن فى مستواهم العلمى من الاخصائيين وذ لك بشرط أن يكون أحدهما على الأقل من خارج المعهد . ويتم إعتماد تشكيل لجنة الحكم من نائب رئيس الجامعة للدراسات العليا والبحوث.

٣. يجوز أن تتم المناقشة بحضور أحد ممثلى لجنة الإشراف فى لجنة الحكم فى حالة تعذر حضور المشرفين الآخرين.

٤. إذا لم تناقش الرسالة خلال ثلاثة أشهر من تاريخ إعتماد الجامعة لتشكيل لجنة الحكم يعاد إعتماد اللجنة بنفس الأعضاء مرة أخرى وفى حالة عدم إنعقاد اللجنة يتم تغيير تشكيل اللجنة بلجنة أخرى.

٥. للجنة الحكم أن توصى بإعادة الرسالة إلى الباحث لإستكمال ما تراه من نقص على أن تتقدم بتقرير جماعى للقسم المخ تص توصى فيه بمنح الطالب مهله لإستكمال ملاحظاتها خلال ستة أشهر على الأكثر من تاريخ المناقشة على أن توافق لجنة الحكم أو من تفوضه على إجازة الرسالة.

الباب الخامس
قواعدالحصول على درجة الدكتوراه

مادة (١٨):

شروط التسجيل

يشترط التالى فى تسجيل الطالب لدرجة الدكتوراه بالإضافة للشروط الواردة فى مادة (٥):

١. أن يكون حاصلاً على درجة الماجستير فى فرع التخصص أو فى ما يعادله من إحدى الجامعات المعترف بها من المجلس الأعلى للجامعات.
٢. يجوز لمجلس المعهد بناءً على اقتراح مجلس القسم المختص قبول تسجيل الطالب الحاصل على درجة الماجستير في غير فرع التخصص . وفى حالة إقرار عدداً م ن المقررات الدراسية التكميلية فى مستوى البكالوريوس أو أعلى والتى يراها القسم ضرورية فإنه يجب على الطالب إجتيازها بنجاح. بحيث لا يتجاوز عدد المقررات التكميلية عن أربعة مقررات بشرط الا تكون متطلباً سابقاً للمقررات الأساسية . وفى حالة زيادتها عن أربعة مقررات يقضى الطالب سنة تأهيلية للنجاح فى هذه المقررات كشرط للقيد فى الدراسة التمهيدية ولا تحسب له هذه المقررات ضمن ساعات البرنامج.
٣. يعقد للطالب إمتحان شامل Comprehensive Exam شفوياً و تحريرياً فى مجال التخصص وذلك بعد إجتياز المقررات الدراسية بنجاح ومتوسط تراكمى للدرجات CGPA لا يقل عن C^+، وإلا وجب على الطالب التسجيل فى مقررات إضافية أو إعادة بعض المقررات لتحسين متوسط تقدير الدرجات ويهدف الإمتحان الشامل إلى قياس قدرة الطالب عمقاً وشمولاً فى إستيعاب موضوعات التخصص الرئيسى والتخصصات الفرعية المساندة ويهدف إلى قياس قدرة الطالب المنهجية على التأمل والتحليل والإستنتاج وإقتراح الحلول المناسبة لما يعرض عليه من أسئلة. بعد اجتياز الطالب للامتحان الشامل يتقدم بطلب لتسجيل موضوع الرسالة . (وتطبق آلية أداء الأمتحان الشامل لدرجة الدكتوراه طبقاً لما ورد بقرار مجلس الجامعة رقم ١٢ لسنة ٢٠٠٩ المنصوص عليه فى ملحقات اللائحة)..
٤. يعرض الطالب خطة البحث فى سيمينار للقسم قبل التقدم بتسجيل موضوع الرسالة وعرضه على مجلس القسم.
٥. الحصول على الرخصة الدولية للحاسب الآلى ICDL وتحديد مستوى اللغة الأجنبية كشرط لنيل درجة الدكتوراه ووفقاً للقرارات المنظمة الصادرة من مجلس الجامعة، ما لم يجتازهم الطالب بنجاح أثناء الدراسة السابقة.
٦. بعد نجاح الطالب فى جميع المقررات الخاصة بالدرجة بمتوسط تراكمى للدرجات CGPA لا يقل عن C^+ والإنتهاء من موضوع الرسالة يتم عرض تقرير صلاحية الرسالة على مجلس القسم.
٧. تمنح درجة الدكتوراه للطالب الذى يجتاز مناقشة رسالته العلمية وجميع متطلبات الدرجة وذلك بناءاً على إقتراح مجلس القسم وموافقة مجلس المعهد . ولا يرصد التقدير أو المعدل التراكمى للدرجات فى شهادة الدكتوراه.

مادة (١٩):

الساعات الدراسية للبرنامج

لكى يحصل الطالب على درجة الدكتوراه يجب أن يدرس ويجتاز بنجاح عدد ٤٨ ساعة معتمدة بيانها كالآتى:

- ٢٤ ساعة معتمدة مقررات بالإضافة إلى ٢٤ ساعة معتمدة رسالة علمية.

مادة (٢٠):

هيئة الإشراف

١. يقر مجلس المعهد تشكيل لجنة الإشراف على الطالب المسجل لدرجة الدكتوراه بناءاً على إقتراح مجلس القسم ووفق خطة القسم البحثية من بين الأساتذة أو الأساتذة المساعدين. ويجوز للمدرسين الإشتراك فى الإشراف بحيث لا يزيد عدد المشرفين عن أربعة أعضاء . ويجوز للطالب الإختيار بين عدد من الموضوعات البحثية المطروحة طبقاً للقواعد الموضوعة لكل تخصص.

٢. فى حالة قيام الطالب ببحث خارج الجامعة يجوز بموافق ة مجلس المعهد أن يشترك فى الإشراف أحد المتخصصين من حملة درجة الدكتوراه أو من ذوى الخبرة فى مجال التخصص من الجهة التى يجرى فيها البحث وفى جميع الأحوال.
لا تزيد لجنة الإشراف عن أربعة أعضاء وعلى أن يكون المشرف الرئيسى من الجامعة.

٣. فى حالة سفر أحد المشرفين ولم يمض على إشرافه عام فلمجلس المعهد أن يرفع إسمه من لجنة الإشراف بناءا على إقتراح مجلس القسم ويتم توجيه الشكر إلية فى إهداء الرسالة.

٤. وفى حالة سفر المشرف على الرسالة بعد مضى عام على التسجيل يقدم سيادته تقريراً علمياً عن مدى تقدم الطالب فى البحث خلال مدة الأشراف على الرسالة موقعاً عليه من باقى المشرفين مع الأحتفاظ بحقه فى نشر نتائج الرسالة . وفى تقرير الصلاحية يكتفى بتقرير المشرف أو المشرفين بالداخل.

٥. يحرر المشرفون على الرسالة تقريراً دورياً عن مدى تقدم الطالب كل ستة أشهر من تاريخ تسجيل خطة البحث. ويتم التوقيع عليه من قبل لجنة الإشراف مجتمعة. وفى حالة إختلاف آراء أعضاء لجنة الإشراف يقوم القسم العلمى بدراسة الحالة وإتخاذ القرار المناسب . تعتمد التقارير من مجلس القسم ولجنة الدراسات العليا بالمعهد ويتم إخطار الطالب عن طريق إدارة الدراسات العليا بالمعهد برأي لجنة الإشراف عن مدى تقدمه فى الرسالة (إستمرار التسجيل أو إنذار الطالب أو إلغاء تسجيل الرسالة).

٦. يشطب تسجيل الطالب من البرنامج إذا حرر له ثلاثة تقارير دورية تفيد بأن أداءه غير مرض وذلك بعد توجيه ثلاثة إنذارات له.

مادة (٢١):

لجنة الحكم

تتقدم لجنة الإشراف على الرسالة بعد ا لإنتهاء من إعدادها إلى مجلس القسم المختص تمهيداً للعرض على مجلس المعهد بالآتى:

١. تقرير عن صلاحية الرسالة للمناقشة موضح به مستواها العلمى والبحثى والإضافات العلمية التى قام بها الباحث، ويقوم بالتوقيع عليه جميع المشرفين . كما تقدم لجنة الإشراف إقتراحاً بتشكيل لجنة الحكم على الرسالة.

٢. يشكل مجلس المعهد بناءاً على إقتراح مجلس القسم المختص لجنة الحكم على الرسالة من ثلاثة أعضاء احدهما المشرف على الرسالة والعضوان الآخران من بين الأساتذة بالجامعات ويكون رئيس اللجنة أقدم الأساتذة وفى حالة تعدد المشرفين يجوز أن يشتركوا فى اللجنة على أن يكون لهم صوت واحد. ويجوز أن يكون العضوان أو أحدهما من الأساتذة السابقين أو من فى مستواهم العلمى من الأخصائيين وذلك بشرط أن يكون أحدهما على الأقل من خارج الجامعة . ويتم إعتماد تشكيل لجنة الحكم من نائب رئيس الجامعة للدراسات العليا والبحوث.

٣. يجو ز أن تتم المناقشة بحضور أحد ممثلى لجنة الإشراف فى لجنة الحكم فى حالة تعذر حضور المشرفين الآخرين.

٤. إذا لم تناقش الرسالة خلال ثلاثة أشهر من تاريخ إعتماد الجامعة لتشكيل لجنة الحكم يعاد إعتماد اللجنة بنفس الأعضاء مرة أخرى وفى حالة إشتراك ممتحن اجنبى يجوز أن تمتد هذه الفترة إلى أربعة أشهر وفى حالة عدم إنعقاد اللجنة يتم تغيير تشكيل اللجنة بلجنة أخرى.

٥. للجنة الحكم أن توصى بإعادة الرسالة إلى الباحث لإستكمال ما تراه من نقص على أن تتقدم بتقرير جماعى للقسم المختص توصى فيه بمنح الطالب مهله لإستكمال ملاحظاتها خلال ستة أشه ر على الأكثر من تاريخ المناقشة على أن توافق لجنة الحكم أو من تفوضه على إجازة الرسالة.

مادة (٢٢):

البرامج المشتركة من جامعات أخرى

يجوز منح شهادات أو درجات علمية مشتركة مع جامعات أخرى بنظام البرامج الثنائية Dual Degree أو بنظام Joint Degree. وفقاً للضوابط التى يحددها مجلس الجامعة.

الباب السادس
التعليم المستمر

مادة (٢٣):

١. يحق للطالب أن يسجل فى مقررات دراسية من برنامج الدراسات العليا من خلال برنامج التعليم المستمر وذلك بعد موافقة مجلسى القسم والمعهد. وتبلغ الجامعة بأسماء الطلبة المقبولين فى برنامج التعليم المستمر حتى الأسبوع الثالث من بدء الدراسة كحد أقصى.
٢. فى حالة إجتياز الطالب المقرر ومتطلباته بنجاح يمنح إفادة بذلك.
٣. يجوز للطالب أن يقوم بتحويل هذه المقررات إلى أحد برامج الدراسات العليا إذا ما استوفى شروط القبول بالبرنامج على ألا يمر أكثر من خمس سنوات على دراستها بالنسبة لبرنامج الدبلوم والماجستير وسبع سنوات لبرنامج الدكتوراه.

مادة (٢٤):

البرامج التبادلية:

١. يجوز لمجلس المعهد بناءاً على إقتراح مجلس القسم المختص وإعتماد الجامعة السماح لطلاب الدراسات العليا بدراسة بعض مقررات الدراسات العليا بالجامعات الأجنبية المرتبطة مع جامعة الإسكندرية بإتفاقيات تفاهم ثنائية. ويتم إحتساب هذه المقررات ضمن متطلبات منح الدرجة ويسمح للطالب أن يحول أى عدد من هذه المقررات التى نجح منها بتقدير C على الأقل أو ما يعادله إلى أى من برامج الدراسات العليا التى يرغب فى الالتحاق بها إذا كانت هذه المقررات من متطلبات البرامج وتدخل ساعات هذه ا لمقررات فى حساب المتوسط التراكمى للدرجات GPA ويشرط عدم مرور أكثر من خمس سنوات على دراستها بالنسبة لبرامج الدبلوم والماجستير وسبع سنوات لبرامج الدكتوراه.
٢. يجوز لمجلس المعهد بناءاً على إقتراح مجلس القسم المختص السماح للطلاب الأجانب المقيدين بجامعات اجنبية بدراسة بعض مقررات الدراسات العليا بالمعهد وفى حالة إجتياز الطالب المقرر ومتطلباته بنجاح يمنح إفادة بذلك.
٣. يجوز لمجلس المعهد بناءاً على إقتراح مجلس القسم المختص السماح للأساتذة من جامعات أجنبية متميزة بتدريس بعض مقررات الدراسات العليا بالمعهد.

مادة (٢٥):

التعليم عن بعد :

يجوز لمجلس المعهد بناءاً على إقتراح القسم المختص السماح للطلاب المصريين والأجانب بالإلتحاق ببرامج الدراسات العليا المشتركة مع الجامعات الأجنبية المرتبطة مع جامعة الإسكندرية بإتفاقيات ثقافية عن طريق التعليم عن بعد أو التعليم الإلكترونى.

مادة (٢٦):

للمعهد الحق فى فتح تخصصات جديدة للدبلومات ولدرجتى الماجستير والدكتوراه التى تقترحها الأقسام بعد موافقة مجلس المعهد ومجلس الجامعة والجهات المختصة من وزارة التعليم العالى.

مادة (٢٧):

يعمل بهذه اللائحة إعتباراً من الفصل الدراسى الاول (فصل الخريف) للعام الجامعى ٢٠٠٩/٢٠١٠.
وذلك بناء على قرار مجلس الجامعة بجلسته المنعقدة فى ٢٠١٠/١/٣١.

برامج الدراسات العليا بمعهد البحوث الطبية

الدبلوم

الدرجة	المؤهل المطلوب للإلتحاق	عدد الساعات المعتمدة			
		الأساسية	الإختيارية	الرسالة	الكلى
١- دبلوم الأخلاقيات الحيوية و الطبية	درجة البكالور يوس أو ما يعادلها / يناظرها فى المجال من جامعة معترف بها	٢٦	٤	-	٣٠
٢- دبلوم بنك الدم ونقل الدم	درجة بكالوريوس الطب أو التمريض	٢٥	٥	-	٣٠
٣- دبلوم الطفيليات التجريبية و الإكلينيكية	درجة بكالوريوس الطب	٢٦	٤	-	٣٠
٤- دبلوم فى المناعة التشخيصية	درجة بكالوريوس الطب، الصيدلة، العلوم وما يعادلها	٢٢	٨	--	٣٠
٥- دبلوم فى أمراض الحساسية	درجة بكالوريوس الطب و دبلوم أو درجات عليا فى مختلف التخصصات الطبية (صدر، أنف وأذن، أمراض جلدية وباطنة)	٢٦	٤	--	٣٠
٦- دبلوم فى الفيزياء الحيوية الطبية	درجة بكالوريوس الطب، طب الاسنان، الصيدلة، التمريض، الطب البيطرى، العلوم، الزراعة، العلوم الطبية أو الهندسة	٢٤	٦	--	٣٠
٧- دبلوم طب القلب الوقائى	بكالوريوس الطب	٢٦	٤	-	٣٠
٨- دبلوم طب الألم	درجة بكالوريوس طب و جراحة	٢٥	٥	--	٣٠
٩- دبلوم فى المعلوماتية الحيوية الطبية والإحصاء الطبى	درجة بكالوريوس الطب، الصيدلة، طب الأسنان، الطب البيطرى، العلاج الطبيعى، التمريض، العلوم أو الهندسة	٢٠	١٠	--	٣٠
١٠- دبلوم في التصوير الطبي للثدي	درجة بكالوريوس الب والجراحة وحاصل على درجة الماجستير أو درجة الدكتوراه او درجة الزمالة فى الأشعة التشخيصية	٢٤	١٠	-	٣٠

الماجستير

الدرجة	المؤهل المطلوب للإلتحاق	عدد الساعات المعتمدة			
		الأساسية	الإختيارية	الرسالة	الكلى
١- ماجستير فى الكيمياء الحيوية	بكالوريوس الطب، الصيدلة، العلوم أوالطب البيطرى	٢٤	٦	٨	٣٨
٢- ماجستير فى الكيمياء الطبية التطبيقية	بكالوريوس العلوم، الصيدلية أو بكالوريوس الطب و الجراحة	٢٤	٦	٨	٣٨
٣- ماجستير فى الفسيولوجيا الإكلينيكية	بكالوريوس الطب والجراحة	٢٦	٤	٨	٣٨
٤- ماجستير فى الأقربازين والعلاج التجريبى	بكالوريوس الصيدلة أو الطب	٢٦	٤	٨	٣٨
٥- ماجستير فى الأحياء الدقيقة الجزيئية والتشخيصية	درجة بكالوريوس الطب، الصيدلة، طب الأسنان، الطب البيطرى أو العلوم.	٢٦	٤	٨	٣٨
٦- ماجستير مكافحة العدوى وعلاجها	بكالوريوس الطب، التمريض، طب الأسنان، الصيدلة، الطب البيطرى، العلوم أو درجة معادلة من جامعة معترف بها	٢٦	٤	٨	٣٨
٧- ماجستير فى الطفيليات ال تطبيقية والجزيئية	بكالوريوس الطب، الطب البيطرى، الصيدلة، العلوم أو الزراعة	٢٤	٦	٨	٣٨
٨- ماجستير فى المناعة والحساسية	كلية الطب، الصيدلة، الطب البيطرى، العلوم وما يعادلها	٢٠	١٠	٨	٣٨
٩- ماجستير فى كيمياء وبيولوجيا الخلايا الأنسجة	بكالوريوس علوم، طب، طب بيطرى، صيدلة، تربية (قسم بيولوجى)	٢٤	٦	٨	٣٨
١٠- ماجستير فى الفحص الخلوى للسوائل والأنسجة	بكالوريوس الطب والجراحة	٢٤	٦	٨	٣٨
١١- ماجستير فى بيولوجيا الإشعاع	بكالوريوس الطب، الطب البيطرى، الهندسة، العلوم أو الزراعة	١٨	١٢	٨	٣٨
١٢- ماجستير فى الفيزياء الحيوية الطبية	بكالوريوس الطب، طب الاسنان، الصيدلة، التمريض، الطب البيطرى، العلوم، الزراعة، العلوم الطبية أو الهندسة	٢٤	٦	٨	٣٨
١٣- ماجستير فى الوراثة الإنسانية	بكالوريوس الطب أو العلوم أو الصيدلة	٢٦	٤	٨	٣٨
١٤- ماجستير الوبائيات الحيوية الجزيئية	بكالوريوس الطب، الصيدلة، طب الأسنان، التمريض، أو الطب البيطرى من جامعة معترف بها	٢٤	٦	٨	٣٨
١٥- ماجستير فى الجراحة التجريبية	بكالوريوس الطب	٢٦	٤	٨	٣٨
١٦- ماجستير فى طب الألم	بكالوريوس الطب والجراحة	٢٥	٥	٨	٣٨

الدرجة	المؤهل المطلوب للإلتحاق	عدد الساعات المعتمدة			
		الأساسية	الإختيارية	الرسالة	الكلى
١٧- ماجستير فى الباثولوجيا الكيميائية	بكالوريوس الطب أو الصيدلة	٢٢	٨	٨	٣٨
١٨- ماجستير فى الأجهزة الحيوية الطبية	بكالوريوس الهندسة أو ما يعادلها	٢١	٩	٨	٣٨
١٩- ماجستير فى معالجة الصور الحيوية الطبية	بكالوريوس الهندسة أو ما يعادلها	٢١	٩	٨	٣٨
٢٠- ماجستير فى المعلوماتية الحيوية الطبية والإحصاء الطبى	بكالوريوس الطب، الصيدلة، طب الأسنان، الطب البيطرى، العلاج الطبيعى، التمريض، العلوم او الهندسة	٢٠	١٠	٨	٣٨
٢١- ماجستير فى البيولوجيا الجزيئية الطبية	بكالوريو س الطب، العلوم، الزراعة، الصيدلة أو الطب البيطرى أو ما يعادلهم	٢٤	٦	٨	٣٨

الدكتوراه

الدرجة	المؤهل المطلوب للإلتحاق	عدد الساعات المعتمدة			
		الأساسية	الإختيارية	الرسالة	الكلى
١- دكتوراه فى الكيمياء الحيوية	درجة الماجستير فى الكيمياء الحيوية أو ما يعادلها من كليات الطب، الصيدلة، العلوم أو الطب البيطرى	١٨	٦	٢٤	٤٨
٢- دكتوراه فى الكيمياء الطبية التطبيقية	درجة الماجستير فى الكيمياء الطبية التطبيقية أو ما يعادلها من كليات العلوم، الصيدلة، الطب و المعاهد الدراسية العليا	١٥	٩	٢٤	٤٨
٣- دكتوراه فى الفسيولوجيا الإكلينيكية	درجة الماجستير أو ما يعادلها فى الفسيولوجيا الإكلينيكية	١٨	٦	٢٤	٤٨
٤- دكتوراه فى الأقربازين والعلاج التجريبى	درجة الماجستير أو ما يعادلها فى الفارماكولوجى أو الفارماكولوجى والعلاج التجريبى من كليات الطب أو الصيدلة	٢٠	٤	٢٤	٤٨
٥- دكتوراه طب وباثولوجيا أمراض الدم	درجة الماجستير أو ما يعادلها فى أمراض الدم الإكلينيكية أو الباثولوجيا الإكلينيكية أو الأمراض الباطنة أو الأطفال	٢١	٣	٢٤	٤٨
٦- دكتوراه فى الأحياء الدقيقة الجزيئية والتشخيصية	درجة الماجستير أو ما يعادلها فى الميكروبيولوجيا الطبية أو الميكروبيولوجيا الصيدلية	٢٠	٤	٢٤	٤٨
٧- دكتوراه فى الطفيليات التطبيقية و الجزيئية	درجة الماجستير أو درجة معادلة فى الطفيليات التطبيقية، الطفيليات أو طب المناطق الحارة	١٧	٧	٢٤	٤٨
٨- دكتوراه فى المناعة والحساسية	ماجستير أو ما يعادلها فى المناعة	١٥	٩	٢٤	٤٨
٩- دكتوراه فى فى كيمياء وبيولوجيا الخلايا الأنسجة	درجة الماجستير أو ما يعادلها فى كيمياء الأنسجة وبيولوجيا الخلايا	١٨	٦	٢٤	٤٨
١٠- دكتوراه فى الفحص الخلوى للسوائل والأنسجة	ماجستير علم الأمراض، ماجستير أمراض الخلايا والأنسجة	١٨	٦	٢٤	٤٨
١١- دكتوراه فى بيولوجيا الإشعاع	ماجستير أو ما يعادلها فى بيولوجيا الإشعاع	١٨	٦	٢٤	٤٨
١٢- دكتوراه فى الفيزياء الحيوية الطبية	درجة الماجستير أو ما يعادلها فى الطبيعة (الفيزياء) الطبية الحيوية	١٨	٦	٢٤	٤٨
١٣- دكتوراه فى الوراثة الإنسانية	درجة الماجستير فى الوراثة الإنس انية أو ما يعادلها	٢٢	٢	٢٤	٤٨
١٤- دكتوراه فى الجراحة التجريبية	درجة الماجستير أو ما يعادلها فى الجراحة أو الجراحة التجريبية	٢٠	٤	٢٤	٤٨
١٥- دكتوراه فى طب الألم	ماجستير فى طب الألم أو ماجستير تخدير أو ما يعادلهما	٢٠	٤	٢٤	٤٨
١٦- دكتوراه فى الباثولوجيا الكيميائية	ماجستير فى الباثولوجيا الكيميائية أو الإكلينيكية	١٨	٦	٢٤	٤٨
١٧- دكتوراه فى المعلوماتية الحيوية الطبية والإحصاء الطبى	ماجستير او ما يعادلها فى المعلوماتية الطبية	١٤	١٠	٢٤	٤٨

Diploma in Biomedical Ethics

1700650 – Multi disciplinary

Admission Requirements: Graduate students holding a bachelor degree in an equivalent/ corresponding field from an accredited University

Core Courses (26 Cr): 1700651,1700652,1700653,1700654,1700655,1700656,1700657, 1700658,

Elective courses (4 Cr): 1700659, 1700660, 1700661**, 1700662, 1700663, 1700664**

Core Courses (26 Cr)

Code	Name	Hours / Week		
		Theoretical	**Practical**	**Total Cr**
1700651	Introduction to biomedical ethics	1	-	1
1700652	Abortion	3	-	3
1700653	Human cloning & embryonic stem cells	4	-	4
1700654	Reproduction & genetics	3	2	4
1700655	Death & euthanasia	2	-	2
1700656	The doctor –patient relationship	4	-	4
1700657	Clinical research & experimentation on human subjects	4	-	4
1700658	Ethical issues surrounding organ transplantation & surrogacy	4	-	4
		25	2	26
Elective courses (4 Cr)				
1700659	Effects of religions and culture in health care decision making	1	-	1
1700660	Ethical committees	2	-	2
1700661	Ethical codes	2	-	2
1700662	Duties and responsibilities of the Physician	2	-	2
1700663	Medical Errors	2	-	2
1700664	Ethics in Emergency Medicine:	1	-	1

Course Description of the courses offered by Biomedical Ethics

1700651 Introduction to biomedical ethics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

The course will clarify the relationship between law and medicine as well as introducing the human rights especially the health rights for individuals specifying the governmental duties towards the population and the physician duties towards his patients.

1700652 Abortion

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	-	3

This course deals with an important topic as regard rights to life clarifying the moral and legal status the embryo, the cases in which aboration is accepted and when it is considered immoral, and abortion as a medically prescribed solution for previously known impaired infants.

1700653 Human cloning & embryonic stem cells

Hour/Week		
Theoretical	**Practical**	**Total Cr**
4	**-**	**4**

This course starts with an introduction on the biology of cloning and discuses the moral arguments against it also introduces the new techniques working on human embryonic stem cells as regard the science, the morality and alternative techniques.

1700654 Reproduction **& genetics**

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Gene structure function
- Chronoscopes : normal & abnormal including cell
- Inheritance
- Teratagens
- Prenatal diagnosis
- Sex determination differentiation
- Puberty and sexual maturation
- Abnormal sex differentiation
- Precocious puberty –delayed puberty
- Genetics of male infertility
- Genetics of female infertility
- Pre implantation genetic diagnosis

1700655 Death & euthanasia

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

This course starts by studying the Hippocratic Oath and to what extent it is applied actually, then proceeds by the introduction of the fundamental elements of the patient-physician relationship bases on mutual trust and respect of privacy. Metaphors and models of doctor-patient relationship will be dealt with during the course.

1700656 The doctor patient relationship

Hour/Week		
Theoretical	**Practical**	**Total Cr**
4	-	4

The course presents the guidelines for clinical research & experimentation on human subjects and deals with the ethics of clinical research and other topics such as the informed consent, ethics of Sham surgery and experimental research and animal welfare.

1700657 Clinical research & experimentation on human subjects

Hour/Week		
Theoretical	**Practical**	**Total Cr**
4	-	4

This course is dedicated to establish the conditions and ethics of organ donation and cadaver donation for teaching purposes. On the other hand, it deals with the problem of selling babies and bodies for financial profit.

1700658 Ethical issues surrounding organ transplantation & bsurrogacy

Hour/Week		
Theoretical	**Practical**	**Total Cr**
4	j-	4

In the past few years, a growing need for ethical committee has been brought to the surface and in this course many topics will be discussed such as the applied procedures of the committee, the commitment of its members, the designed policies and their application as well as the guidelines for its frame of function.

1700659 Effects of religions and culture in health care decision making

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

This course will establish a study between the various ethical codes as regard of place such as the Egyptian, European, American codes identifying the resemblance and differences between them as well as religious codes such as the Islamic one.

1700660 Ethical committees

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

This courses starts with the definition of death from the medical aspect and proceeds with the medicolegal and ethical issue in the determination of death.

1700661 Ethical codes

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

The aim of this course is to bring up the effects of religions and culture in health-care related issues and to what extent the conflict between them is resolved.

1700662 Duties and responsibilities of the Physician

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Working with patients, work of consultant physicians, Quality of healthcare, acute medicine: quality of care and standards of medical care, Standards to improve continuity of care for medical inpatients, Details of out-of-hours cover and the hospital night team. Medical professionalism: Professional responsibilities in education, training and assessment, and research. Supporting staff and facilities: Consultant's office, Secretarial support, clinical information and information technology and continued professional development

1700663 Medical Errors

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Definition , types of Errors ,prevalence & causes, reporting medical errors, medical errors financial Cost, national standards improving patient safety, safe practices for improving patient safety, facilitating information transfer and clear communication, safe Practices measurements, strategies to reduce medication errors, barriers to preventing and eliminating medical errors

1700664 Ethics in Emergency Medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

Principles of ethics for emergency physicians, unique duties of emergency physicians, incompetent physicians, the Emergency Physician-Patient Relationship, relationships with other physicians, relationships with nurses and paramedical personnel, relationships with the legal system as an expert witness.

Master Degree in Biochemistry

1701700-Department of Biochemistry

Admission Requirements: Graduate students with a. M.B. Ch. B. of Medicine, B. Sc. of Pharmacy, Science or Veterinary

Core courses (24 Cr): 1701701, 1701702, 1701703, 1701704, 1701705, 1701706, 1701707, 1701708.

Elective courses (6 Cr): 1703720, 1704720, 1705720, 1717720. 1706720, 1707720, 1708720, 1709720, 1712720, 1721720.

Thesis (8 Cr)

Core Courses (24 Cr)

Code	Name	Hours/week		
		Theoretical	Practical	Total Cr
1701701	Biochemistry {I}	3	2	4
1701702	Biochemistry {II}	3	-	3
1701703	Biochemistry {III}	3	2	4
1701704	Biochemistry {IV}	3	-	3
1701705	Molecular biology {I}	2	-	2
1701706	Molecular biology {II}	2	2	3
1701707	Molecular biology {III}	2	-	2
1701708	Molecular biology {IV}	2	2	3
		20	8	24
Elective courses (6 credit hours)				
1703720	Physiology	1	2	2
1704720	Pharmacology	1	2	2
1705720	Hematology	1	2	2
1717720	Chemical pathology	1	2	2
1706720	Bacteriology	1	2	2
1707720	Parasitology	1	2	2
1708720	Immunology	1	2	2
1709720	Histochemistry and Cell biology	1	2	2
1712720	Medical biophysics	1	2	2
1721720	Medical statistics	1	2	2

Doctor of Philosophy in Biochemistry

1701800-Department of Biochemistry

Admission Requirements: Graduate students with a. M.Sc. of Biochemistry or Applied Chemistry or an equivalent degree of the faculties of Medicine, Pharmacy, Science or Veterinary.

Core courses (18Cr): 1701801 ,1701802,1701803,1701804, 1701805, 1701806,1701807, 1701808

Elective courses (6 Cr):

Elective 1 (3 Cr): 1703820, 1704820, 1705820, 1717820.

Elective 2 (3 Cr): 1706820, 1707820, 1708820, 1709820, 1712820, 1713820, 1721820.

Ph.D. Thesis (24 Cr)

Core courses (18 Cr)

Code	Name	Hours/week		
		Theoretical	Practical	Total Cr
1701801	Biochemistry (V)	2	2	3
1701802	Biochemistry (VI)	2	-	2
1701803	Biochemistry (VII)	2	-	2
1701804	Biochemistry (VIII)	2	-	2
1701805	Molecular biology (V)	2	2	3
1701806	Molecular biology (VI)	2		2
1701807	Molecular biology (VII)	2	-	2
1701808	Molecular biology (VIII)	2	-	2
		16	4	18
Elective courses (6 credit hours)				
Elective I: 3 Credit hours				
1703820	Physiology	2	2	3
1704820	Pharmacology	2	2	3
1705820	Hematology	2	2	3
1717820	Chemical pathology	2	2	3
Elective II: 3Credit hours				
1706820	Bacteriology	2	2	3
1707820	Parasitology	2	2	3
1708820	Immunology	2	2	3
1709820	Histochemistry and cell biology	2	2	3
1712820	Medical biophysics	2	2	3
1713820	Human genetics	2	2	3
1721820	Medical statistics	2	2	3

Description of the courses offered by Biochemistry Department

1701701 Biochemistry I

Hours/week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Enzyme: structure, mechanism, factors affecting enzyme activity, enzyme kinetics
- **Electrolytes and acid base balance:** The actions of buffer systems, electrolytes,
- **Bioenergetics and biochemical calculations**
- Carbohydrate metabolismCarboxylic acid cycle, the basic concepts of glycogen metabolism,
- proteins structure and functions,nucleic acids structure and function, catabolism of purines and
- pyrimidines bases. The porphyrine and bile pigments structure, function and metabolism .

1701702 (Biochemistry II)

Hours/week		
Theoretical	**Practical**	**Total Cr**
3	-	3

- **Nutrition:** healthy diets, malnutrition, mental disorders, obesity, complications of obesity, mental retardation energy requirements.
- Hormones and Signal transduction pathways: cell-cell communications, signaling molecules ,
- surface receptors and intracellular receptors receptors.
- **Biological Oxidation :**Free radical formation-antioxidants defense mechanisms, oxidative damage of DNA and Protein
- **Minerals and Trace Elements:** macrominerals, microminerals, minerals functions, regulation, deficiency and toxicity.

1701703 Biochemistry III

Hours/week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- **Metabolic Disorders. :**disorders of main metabolic pathways of carbohydrates, proteins, and lipic
- diabetes mellitus as a complex metabolic disorder, glycogen storage disease galactosemia,
- urea cycle disorder, lipidosis, hyperlipoproteinemia and Hypolipoproteinemia
- **Vitamins in health and diseases**:bioavailability, requirements, metabolism, interactions, functions of vitamins in health and disease
- **Chemistry of Blood :**blood lipoproteins and transport systems, function and metabolism of the red blood cell, haem synthesis, and structure of hemoglobin and myoglobin

1701704 Biochemistry IV

Hours/week		
Theoretical	**Practical**	**Total Cr**
3	**-**	**3**

- **Clinical Biochemistry.** Ecosanoids,biochemical basis of atherogensis. Implication of angiogenesis in different diseases. Stem cell mediated angiogenesis.
- **Xenobiotics:** Phases of detoxification,phase I – modification phase II – conjugation, phase III - further modification and excretion of Xenobiotics in the environment
- **Special** Biochemical topics:

1701705 Molecular biology I

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- The basic concepts of molecular biology: general prenciples of cells and genomes
- RNA structures and functions
-DNA structure , replication, mutation, repair
-Translation, and Transcription process
-RNA Processing
-Protein Synthesis and the Genetic Code
-Protein Synthesis and Protein Processing

1701706 Molecular biology II

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

- The central dogma of molecular biology.
- Genetic recombination in prokaryotes and eukaryotes.
- Crossing over and its consequences
- Homologous recombination and transposition
- Conservative site specific recombination
- Reverse transcription:Reverse transcriptase,Human Immunodeficiency virus, and Telomerases

1701707 Molecular biology III

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- **The concepts of proto-oncogenes**
- Mutations that convert proto-oncogenes into oncogenes
- The concepts of tumor suppressor genes
- The role of tumor suppressor genes in cell growth and apoptosis
- The role of tumor suppressor genes in cell signaling
- The role of tumor suppressor genes in the process of carcinogenesis signaling

1701708 Molecular biology IV

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Control of gene expression
- Regulation of gene expression in prokaryotes and eukaryotes.
- Chromatin remodeling,
- Transcriptional control.
- Translational control
- Emerging concepts of translational control.

1701801 Biochemistry V

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- The basic concepts of membrane transport systems and cell-cell interaction-
- Signal transduction pathways: The basic knowledge of signal transduction.
- Different types of receptors family. Surface receptors: protein coupled receptors, ion channel receptors, tyrosine receptors,Intracellular receptors: steroid receptors,thyroid hormone receptors ,RXR and orphan receptors
- Types of receptors mutations and related diseases.
- Neurochemistry: Structure of nerve cell and synapses, neurotransmitters classification and regulation Precursors of different classes of neurotransmitters.

1701802 Biochemistry (VI)

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Clinical Biochemistry:
- Ecosanoids (Prostagladins, Leukotrienes and thromboxanes).
- Synthesis of Ecosanoids ,NSAIDs effect on Ecosanoids synthesis
- Biochemical basis of atherogensis.
- Implication of angiogenesis in different diseases and stem cell mediated angiogenesis.
- Chemistry of cancer and carcinogenesis. Biochemical aspects of chemical carcinogenesis. Relation between genes and oncogenes .The role of apoptosis in carcinogenesis . Methods of cancer control and chemotherapy.

1701803 Biochemistry (VII)

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Tumor markers: Classification :Oncofetal protein ,tumor associated antigens , hormones , carbohydrates related antigens, , cytokines and amino sugar derivatives. Clinical application of tumor markers.
- Stem cell :: the basic biology{structure, types, function}
- clinical applications of embryonic and adult stem cell therapies.
- Pollution: The movement of pollutants through the atmosphere and biosphere
- Specific pollutants: Carbon dioxide, nutrients and acid emissions.
- Pesticides, Oil spills, radiation, endocrine disruptors, mercury and other metals

1701804 Biochemistry (VIII)

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Implication of reactive oxygen species in different diseases:
- Oxygen Toxicity, Reactive Oxygen Species and Lipid peroxidation in human pathology and diseases. Healing power of H_2O_2, free radicals in ageing process , arteriosclerosis, ischemic heart diseases and neurodegradative conditions.
- Growth factors: Classification, structure and function, growth factors receptors structure and distribution, Role of growth factors in controlling signalling pathways (AKT, MAPK, JAK-STAT, ...etc). Regulation of cell cycle and oncogene and tumor suppressor genes by growth factors .

1701805 Molecular biology (V)

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	2	3

The key concepts in molecular biology. nucleic acid structure and function, chromosome structure and remodeling DNA/RNA structure, DNA replication, transcription, translation, posttranslational modifications, restriction enzymes, general recombinant DNA techniques (DNA ligations, bacterial transformation, DNA/RNA isolation), DNA sequencing, plasmids, and polymerase chain reaction.

1701806 Molecular biology (VI)

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- Cells and genomes
- Central dogma of molecular biology
- Genetic recombination in Prokaryotes and eukaryotes.
- Bacterial Transformation, transfection, Bacterial conjugation, Bacterial transduction, Crossing over and its consequences, Homologous recombination transposition and Conservative site specific recombination

1701807 Molecular biology (VII)

Hours/week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- The basic knowledge of protein degradation.
- Types of proteases and proteasomes.
- Protein turnover and selective degradation or cleavage proteases and proteasomes.
- Regulation of protein translation at the level of translation
- Post translational modifications of eukaryotic proteins
- Genetic diseases
- Gene therapy.

1701808 Molecular biology (VIII)

Hours/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- Regulation of gene expression in prokaryotes and eukaryotes. Chromatin remodeling,
- Transcriptional control,Ttanslational control. Emerging concepts of translational control.
- Mitochondrial DNA: Repair of Oxidative Damage to Nuclear and Mitochondrial DNA in Mammalian Cells Expression and Maintenance of Mitochondrial DNA
- Special Molecular biology topics: recombinant DNA technology, microarrays, and microRNA

1701720 Biochemistry

Hours/week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Bioenergetics
- Metabolism of carbohydrates, lipid , protein and nucleic acid
- Metabolic disorders

1701721 Molecular biology

Hours/week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Central dogma of molecular biology
- DNA and RNA structures and function
- DNA replication and transcription
- RNA translation
- Mutations

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1701723 Molecular biology

Hours/week		
Theoretical	**Practical**	**Total Cr**
1	-	1

- Central dogma of molecular biology
- DNA and RNA structures and function
- DNA replication and transcription

1701820 Biochemistry	**Hours/week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

- Synthesis of Ecosanoids,NASIDS effect on Ecosanoids Synthesis
- Implication of angiogensis in different diseases and stem cell mediated angiogenesis

1701821 Molecular biology	**Hours/week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

- The basis and concepts of molecular biology
- General principles of cells and genomes
- Different types of gene mutation and associated diseases
- RNA translation and processing

1701822 Biochemistry	**Hours/week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

Synthesis of ecosanoids, NASIDS effect on ecosanoids synthesis.

1**701823** Molecular biology	**Hours/week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- The basic concepts of molecular biology
- General principles of cells and genomes
- RNA structures and function
- DNA structure , replication , transcription and repair
- Different types of gene mutation and associated diseases.
- RNA translation and processing
- Protein synthesis and the genetic code
- protein processing

Master Degree in Applied Medical Chemistry

1702700 – Department of Applied Medical Chemistry

Admission Requirement: Graduate students with B.Sc. of Science, Pharmacy or M.B.Ch.B of Medicine

Core Courses (24 Cr): 1702701, 1702702, 1702703, 1702704, 1702705, 1702706, 1702707, 1702708, 1721720, 1720721

Elective Courses (6 Cr): 1704720,1705720,1706720,1707720,1708720, 1713720.

M.Sc. Thesis: (8 Cr)

Core Courses (24 Cr)

Code	Name	Hours/Week		
		Theoretical	Practical	Total
1702701	Applied medical chemistry I	2	--	2
1702702	Applied medical chemistry II	2	--	2
1702703	Applied medical chemistry III	2	--	2
1702704	Cancer chemistry I	2	--	2
1702705	Cancer chemistry II	3	--	3
1702706	Molecular biochemistry I	3	--	3
1702707	Laboratory techniques I	1	4	3
1702708	Laboratory techniques II	1	4	3
1721720	Medical statistics	1	2	2
1720721	Computer	1	2	2
		18	12	24
Elective Courses (6 Cr)				
1704720	Pharmacology	1	2	2
1705720	Hematology	1	2	2
1706720	Bacteriology	1	2	2
1707720	Parasitology	1	2	2
1708720	Immunology	1	2	2
1713720	Genetics	1	2	2

Doctor of Philosophy in Applied Medical Chemistry

1702800 – Department of Applied Medical Chemistry

Admission Requirement: Postgraduate students with a M.Sc. of Applied Medical Chemistry or an equivalent degree of Faculties of Science, Pharmacy, Medicine or High Studies Institutes

Core Courses (15 Cr): 1702801, 1702802, 1702803, 1702804, 1702805, 1702806, 1702807, 1720823, 1721823.

Elective Courses (9 Cr): 1704820, 1705820, 1706820, 1707820, 1708820**, 1703820,1709820, 1710820**

Ph.D. Thesis: 24 Cr

Core courses (15 Cr)

Code	Name	Hours/Week		
		Theoretical	**Practical**	**Total**
1702801	Applied medical chemistry IV	2	--	2
1702802	Applied medical chemistry V	2	--	2
1702803	Cancer chemistry III	2	--	2
1702804	Molecular biochemistry II	2	--	2
1702805	Molecular biochemistry III	1	--	1
1702806	Laboratory techniques III	--	2	1
1702807	Laboratory techniques IV	--	2	1
1721822	Medical statistics	1	2	2
1720823	Computer	1	2	2
		11	**8**	**15**
Elective Courses (9 Cr)				
1704820	Pharmacology	2	2	3
1705820	Hematology	2	2	3
1706820	Bacteriology	2	2	3
1707820	Parasitology	2	2	3
1708820	Immunology	2	2	3
1703820	Physiology	2	2	3
1709820	Histology & Cell biology	2	2	3
1710820	Pathology	2	2	3

Description of the courses offered by Applied Medical Chemistry Department

Code	Hours/Week		
	Theoretical	Practical	Total Cr
1702701 Applied Medical Chemistry I	2	-	2

Introduction to Basic Biochemistry, cell structure as well as water and solutes**. Amino Acids and Structure of Proteins;** Amino acids structure and function**,** Proteins structure and functions**. Carbohydrates and Glycoconjugates. Nucleotides. Lipids;** Structure and functions of fatty acids**.** Fatty acids as components of Lipids; structure and functions**.** Cell membrane**.** Biologically important lipids**.**

	Hours/Wee		
	Theoretical	Practical	Total Cr
1702702 Applied Medical Chemistry II	2	-	2

Vitamins and Minerals; water and fat soluble vitamins**.** Trace minerals**. Enzymes;** factors affecting enzymatic activity. Enzyme kinetics**.** Coenzymes**. Biochemistry of Hormones;** classifications, structure and functions**.** Biosynthesis and biological roles of hormones**. Metabolism and Bioenergetics;** Glycolysis and Citric acid cycle. **Electron Transport and Oxidative Phosphorylation**.

1702703	Hours/Week		
	Theoretical	Practical	Total Cr
Applied Medical Chemistry III	2	-	2

Metabolism of Fatty Acids and Triglycerides; The generation of metabolic energy from fatty acids, The carbohydrate – to – fat pathway. Amino Acid Metabolism; Metabolism of individual amino acids. The Metabolism of Purines and Pyrimidines; biosynthesis and metabolism of Purine and Pyrimidine, Drugs interfere with nucleotide metabolism, RNA and DNA structure and functions. Protein Biosynthesis, Mechanisms and regulation of protein biosynthesis.

	Hours/Week		
	Theoretical	Practical	Total Cr
1702704 Cancer Chemistry I	2	-	2

Molecular Aspects of Carcinogenesis and Detoxification. Detoxification mechanisms and multistep carcinogenesis. **Environmental Carcinogens;** Chemical Agents: Synthetic and naturally occurring chemical carcinogens, metabolic activation, Test of carcinogenicity. Biological Factors, viruses, bacteria and parasites. Physical Agents; radiations and asbestos. **Tryptophan;** metabolic pathways and its relation to bladder cancer**.**

	Hours/Week		
	Theoretical	Practical	Total Cr
1702705 Cancer Chemistry II	**3**	**-**	**3**

General Aspects of Gene Regulation; Transcription, Regulation of the regulators, Transcription factors in oncogenesis. Oncogenes. Cell Cycle. Growth Factors; Growth factors and malignancy, Growth factors and their receptors as targets for anticancer therapy. Cancer Metastasis. Molecular Approaches of Cancer Diagnosis; Techniques for detection of molecular markers in cancer diagnosis, Molecular approaches to diagnosis in selected cancers. Hereditary Factors and Cancer. Host Anti-Tumourgenesis Mechanisms; Anti-oxidants and DNA damage and repair mechanisms.

1702706 Molecular Biochemistry I	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	-	3

Molecular Biology of Proteins, Enzymes and Nucleic acids; Molecular structure and function of protein, enzyme and nucleic acid. Structural biology of protein and protein-DNA complexes. Techniques for structural analysis. Gene Regulation and Expression; Replication, transcription and translation. Gene organization and expression. Molecular Mechanisms in Biochemistry; Molecular mechanisms of enzyme action (the active site)
Physical-organic interpretation of biochemical reaction mechanisms. Interactions of large molecules. The genetic code and Protein biosynthesis

1702707 Laboratory Techniques I	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	4	3

Solutions and Units of Concentration; types of solutions, physical and chemical units of concentration, preparation of solutions. pH and Buffer; pH of weak and strong acids or bases, titration of strong acid and bases, buffer capacity and buffer preparation. Cell Fractionation; cell structure and applied techniques that used in cell fractionation. Methods of Protein Determination; colorimetric methods used in protein assay. Enzymes; Classification, Isolation, Kinetics and Clinical applications.

1702708 Laboratory Techniques II	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	4	3

Safety Precautions. Spectrophotometeric Technique; Beer-Lambert law**,** Spectrophotometer**,** Applications of spectrophotometeric technique**,** Standard/Calibration curve. **Radio isotopic Technique;** Radioimmunoassay: Principles and applications. **Biochemical Assay and Clinical Applications;** Liver function tests, Kidney function tests and Tumour markers.

1702801 Applied Medical Chemistry IV	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Nutritional Biochemistry and Digestion; Macro and Micronutrients**,** Digestion and Digestive enzymes**. Integration of Fuel Metabolism in Mammals**; Carbohydrates, proteins and fats as metabolic fuels**. Cell and Tissue Structure;** Biological Membranes**,** Cytoskeleton**,** Extracellular matrix**. Metabolic Regulation and Interrelationships;** Metabolic interrelationships of tissues in various nutritional hormonal statuses, Mechanisms involved in the response of cells hormones and growth factors, Regulation of concentration, key enzymes transport systems and structural proteins. **Integration of Metabolism**; Plasma proteins, Extra and intracellular messengers.

1702802 Applied Medical Chemistry V	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Biochemistry of Metabolic Diseases; Diseases related to metabolism of carbohydrates lipid, amino acids, protein, purine and pyrimidine, Iron and heme. Diseases related to digestion and absorption abnormalities. Diseases related to hormones. Cellular Growth Control and Malignant Diseases; Cell cycle control, Mitogenic signals, The molecular basis of malignant diseases. Clinical Applications of RNA and DNA. Specific metabolic pathways and their Clinical Complications; The cytochromes P450 and nitric oxide synthases, Mitochondrial genes and mitochondrial diseases, Reactive oxygen species (ROS), Diseases related to blood coagulation.

1702803 Cancer Chemistry III	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Introduction to Molecular biology of cancer. Biochemical and molecular aspects of tumour induction; Molecular aspects of environmental carcinogenesis and detoxification, Animal models of cancer, Growth factors, Oncogenes, Angiogenesis and Apoptosis, Biochemical characters of cancer cell. Cancer prevention and detection; Biochemical markers; Serum markers, Multiple markers panels, Other body fluids, Bio-molecular methods, Biochemical aspects of anti-cancer drugs; Anti-metabolites, Anti-tumour antibiotics, Platinum analogs, Anti-cancer drugs derived from plants, Mechanisms of anti-tumour drug resistance. Biochemical aspects of different types of cancers.

1702804 Molecular biochemistry II	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Genetic Analysis of Regulatory mechanism; Synthesis of DNA, Synthesis of RNA, Synthesis of protein. Eukaryotic Molecular Biology; Gene organization, Regulation of gene expression, Cell cycle, Molecular biology of cancer. Ribosome Biochemistry and Molecular Biology of Replication; Transcription control, Gene regulation, Allosteric control.

1702805 Molecular biochemistry III	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

Introduction of to Genetic Engineering; Recombinant DNA technology, Northern and Southern blotting, Restriction endonuclease, Taq DNA polymerase. Polymerase Chain Reaction (PCR) Basic principles, Conventional PCR, Real-Time PCR, Application of PCR in diagnosis. Molecular Biochemistry of Diseases; Gene-disease relationship, Molecular mechanisms associated with diseases, Gene therapy

1**7102806** Laboratory Techniques III	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	-	2	1

Introduction to Chromatographic Techniques. Classification of Chromatographic Techniques. Chromatographic Techniques By State of Mobile Phase; Gas Chromatography, Liquid Chromatography and HPLC, Affinity Chromatography. Planner Chromatography; Paper chromatography. Thin layer chromatography. Chromatographic Techniques By Separation Mechanism; Ion exchange chromatography, Size exclusion chromatography.

1702807 Laboratory Techniques IV	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	-	2	1

Introduction to Molecular Biology Techniques. Electrophoresis.
Northern and Southern blotting.
Polymerase Chain Reaction (PCR), Theory, conventional and Real-Time PCR, Clinical Applications of PCR. Molecular Biology Techniques in Diagnosis.

Master Degree in Clinical physiology

1703700 - Department of Human Physiology

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine.

Core Courses (26 Cr): 1703701, 1703702, 1703703, 1703704, 1703705, 1701720, 1721720, 1721721.

Elective Courses (4 Cr):

Elective I (2 Cr): 1700750, 1701721, 1705720, 1708720, 1713720.

Elective II (2 Cr): 1715751, 1715752, 1715753, 1715754, 1715755

M.Sc. Thesis: (8 Cr)

Core courses (26 Cr)

Code	Name	Hours/Week		
		Theoretical	Practical	Total Cr
1703701	Elementary physiology I	3	2	4
1703702	Elementary physiology II	3	2	4
1703703	Clinical physiology I	3	2	4
1703704	Clinical physiology II	3	2	4
1703705	Exercise physiology	3	2	4
1701720	Biochemistry	1	2	2
1721720	Medical statistics	1	2	2
1720721	Computer	1	2	2
		18	**16**	**26**
Elective Courses (4 Cr)				
Elective I (2 Cr)				
1700750	Nutrition	1	2	2
1701721	Molecular biology	1	2	2
1705720	Hematology	1	2	2
1708720	Immunology	1	2	2
1713720	Genetics	1	2	2
Elective II (2 Cr)				
1715751	Chest diseases	1	2	2
1715752	Renal diseases	1	2	2
1715753	Endocrinal diseases	1	2	2
1715754	Cardiac diseases	1	2	2
1715755	Internal medicine	1	2	2

Medical Doctor in Clinical Physiology

1703800 - Department of Human Physiology

Admission Requirements: Postgraduate students with a M.Sc. or an equivalent degree in Clinical Physiology.

Core Courses (18 Cr): 1703801, 1703802, 1703803, 1703804, 1704820.

Elective Courses (6 Cr):
Elective I (**3** Cr)**:** 1700850, 1701821, 1705820, 1708820, 1713820.
Elective II (**3** Cr)**:** 1715851, 1715852, 1715753, 1715854.

M.D. Thesis: (24 Cr)

Core courses (18 Cr)

Code	Name	Hours/ Week		
		Theoretical	**Practical**	**Total Cr**
1703801	Advanced physiology	3	2	4
1703802	Advanced clinical physiology	3	2	4
1703803	Environmental physiology	2	2	3
1703804	Diagnostic physiology	3	2	4
1704820	Pharmacology	2	2	3
		13	**10**	**18**
Elective Courses (6 Credit Hours)				
Elective I (3 Credit Hours)				
1700850	Nutrition	2	2	3
1701821	Molecular biology	2	2	3
1705820	Haematology	2	2	3
1708820	Immunology	2	2	3
1713820	Genetics	2	2	3
Elective II (3 Credit Hours)				
1715851	Chest diseases	2	2	3
1715852	Renal diseases	2	2	3
1715853	Endocrinal diseases	2	2	3
1715854	Cardiac diseases	2	2	3

Description Courses offered by Clinical Physiology Department

Code

1703701 Elementary physiology I

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Cell structure & function: genetic control of protein synthesis, cell reproduction, transport of ions & molecules through the cell membrane.
- Musculo skeletal system.
- Heart: heart muscle, heart as a pump, rhythmic excitation of the heart, circulation, cardiac output ,venous return an d their regulation.
- Pulmonary ventilation, pulmonary circulation, gas exchange. Regulation of respiration, respiratory insufficiency.
- Practical: Osmotic fragility, membrane extraction. ECG. Pulmonary function, ventilation. Lipid peroxidation in erythrocytes. Na,K ATPase determination.

1703702 Elementary physiology II

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Renal system: blood fluid compartments, formation of urine by the kidney, renal regulation of acid base balance.
- Endocrine & reproduction :pituitary hormones and their control by the hypothalamus, the thyroid metabolic hormones.
- The adrenocortical hormones, Insulin,glucagons & diabetes mellitus.
- Reproductive system in male and female.
- Gastrointestinal function: motility, nervous control and blood circulation.
- Secretory function of alimentary tract.
- Digestion & absorption of the GIT.
- Metabolism of carbohydrates, lipid metabolism, protein metabolism, the liver as organ.
- The autonomic nervous system: basic characteristics of sympathetic & parasympathetic function.
- Blood cells, immunity& clotting. Resistance of body infection.
- Practical: Kidney function tests, induction of uremia. Hormonal assay, induction of DM, of hyper& hypothyroidism. Induction of obesity.

1703703 Clinical physiology I

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Cardiac dysfunction & assessment of function : cardiac failure, heart sounds , dynamic of valvular and congenital heart defects. Circulatory shock & physiology of its treatment.
- Respiratory dysfunction & assessment :respiratory insufficiency, pathophysiology, diagnosis and treatment.
- Hypoxia, hypercania. Physiologic peculiarities of specific pulmonary abnormalities.
- Pathophysiology of asthma.
- Endocrinal dysfunction & assessment : diseases of thyroid, abnormalities of adrenocortical secretion.
- Pathophysiology of diabetes mellitus.

1703704 Clinical physiologyII

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	3	4

- Renal disease: Acute renal failure,chronic renal failure.
- Hypertensive kidney disease , nephrotic syndrome.
- Muscle & Nerve dysfunction Exercise physiology in health and disease.
- Muscle blood flow in exercise.
- Cardiovascular and respiratory adaptation to exercise.
- Metabolic adaptation to exercise..

1703705 Exercise physiology	Hour/Week		
	Theoretical	**Practical**	**TotalCr**
	3	2	4

Gain experience in providing services to meet the varying needs of Individuals Exercise in diagnostic testing and advances in exercise fitness and performance. Exercise genomics. Basis of rehabilitation and secondary prevention for various systems. The physiological chemistry of exercise.

1703801 Advanced clinical physiology	Hour/Week		
	Theoretical	**Practical**	**TotalCr**
	3	2	4

- Research methods: different methods applying for experimental human research, study design, study protocols &data analysis
- Bioethics presenting different types of clinical cases including disturbed function assessment &clinical diagnosis. Different topics relating to clinical physiology such as bronchial asthma ,COPD, Heart failure obstructive and restrictive airway disease, renal failure & endocrinal disturbance.
- Project research for training on proposal writing submission & excusion in the field of clinical physiology whether cardiopulmonary, renal & endocrinal

1703802 Advanced physiology	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

- Training on the methods applying in physiology research special emphasis on experimental design
- Training for proposal design submission and implementation in the area of different topics related to physiology (different human organs)
- Presenting topics with recent implication in special areas of physiology as angiogenesis, apoptosis, physiological proteomics and genomics, integrative physiology of the cardiovascular, respiratory, renal, neural and endocrine systems. Advanced topics include neuroendocrine and pharmacological control of renal excretion and circulation. Other topics covered include reproductive physiology, exercise physiology, control of coronary blood flow and neurophysiology

1703803 Environmental physiology	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Aviation, highly altitude and space physiology.
- Effects of low oxygen pressure on the body.
- Acute effects of hypoxia, acclimatization to low Po_2.
- Physiology of deep sea diving and other hyperbaric condition.
- Hyperbaric oxygen therapy.
- Physiology of stress.
- Pathophysiologic disorder of pollution.
- Environment and exercise

1703804 Diagnostic physiology	Hour/Week		
	Theoretica	**Practical**	**Total Cr**
	3	2	4

This course involves clinical measurement procedures with case study and problem solving. It includes: Diagnostic exercise physiology in heart diseases, basics of diagnostic medical sonography, diagnostic techniques in cardiology (echocardiogram, exercise echocardiogram, cardiolyte thallium scan and cardiac catheterization).Various techniques to measure and monitor lung function, sleep disorders and abnormalities, respiratory and blood gas analysis and allergy tests . Neurophysiological studies (EEG, EPS and EMG). Study of the techniques and procedures of diagnosing digestive tract problems Urodynamics and vascular technology.

1703720 Physiology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	3

Membrane and Cell Physiology : Cell structure and function. Membrane phospholipids
Cardiovascular System: The heart as a pump and electrical activity of the heart . Rhythmic excitation of the heart. Arterial blood pressure and hypertension . Cardiac output , venous return and their regulation
Renal Physiology : Body fluid compartments. Formation of urine. Acid base balance. Renal failure
Muscle and Nerve
Blood physiology : Erythropoiesis. Circulating Blood fluids. Platelets, red blood cells& blood groups. Blood Coagulation . Respiratory physiology. Pulmonary Ventilation . Gaseous exchange. Transport of CO2 in blood. Respiratory failure . GIT physiology. GIT Motility. Secretory function of GIT.Digestion & absorption
Endocrine system: Introduction to endocrinology . Thyroid Hormones . Adrenal Hormones . Pancreatic Hormones

1703721 Physiology

Hours/ Week		
Theoretical	**practical**	**Total Cr**
1	1	1

Membrane and Cell Physiology : Cell structure and function. Membrane phospholipids
Cardiovascular System: The heart as a pump and electrical activity of the heart . Rhythmic excitation of the heart. Arterial blood pressure and hypertension . Renal Physiology : Body fluid compartments. Formation of urine. Acid base balance. Renal failure.
Muscle and Nerve
Respiratory physiology

1703750 Nutrition

Hours/ Week		
Theoretical	**practical**	**Total Cr**
1	2	2

Basic nutrition
- Macronutrients: Carbohydrates, Fats, and proteins.
-Minerals: macrominerals, microminerals, and trace elements
- Vitamins: water soluble, fat soluble.
- Dietary guidelines and diet planning

1703820 Physiology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Cell physiology and function. Genetic control of protein synthesis
Membrane physiology: Transport and Membrane potentials**.** Skeletal excitation and contraction**.** Smooth muscle excitation and Contraction
Cardiovascular system : The heart as a pump **.** Rhythmic excitation of heart**.** Pathophysiology of hypertension. Cardiac output and venous return**.** Cardiac failure**.** Coronary circulation and ischemic heart **.** Disease
Renal physiology: Body fluids**.** Formation of urine **.** Acid base balance**.** Renal failure
Blood physiology: Erythropoiesis**.** WBCS resistance to infection **.** Immunity, Allergy**.** Blood groups**.** Haemostasis & coagulation
Respiratory system : Pulmonary Ventilation **.** Gaseous exchange **.** Respiratory failure**.** Pathophysiology of bronchial asthma & COPD
GIT physiology : Pathophysiology of GERD. Pathophysiology of motility & secretary dysfunction
Endocrine physiology: Thyroid hormones in health & diseases. Pathophysiology of obesity. Endocrine function of pancreas**.** Male reproductive hormones**.** Female reproductive system **Autonomic N.S**, **Sport physiology.**,

1703821 Physiology	**Hours/ Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

Cell physiology and function. Genetic control of protein synthesis
Skeletal excitation and contraction**. Smooth muscle** excitation and Contraction
Cardiovascular system : The heart as a pump **.** Rhythmic excitation of heart**.** Pathophysiology of hypertension. Cardiac output and venous return**.** Cardiac failure**.** Coronary circulation and ischemic heart disease
Renal physiology: Body fluids**.** Formation of urine **.** Acid base balance**.** Renal failure
Blood physiology: Erythropoiesis**.** WBCS resistance to infection. Immunity, Allergy**.** Blood groups**.** Haemostasis & coagulation

1703850 Nutrition	**Hours/ Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

-Malnutrition and nutritional assessment, macronutrients: Carbohydrates, Fats, and proteins., vitamins and trace mineral deficiency and excess, eating disorders, obesity and metabolic syndrome
- Entral and parenteral nutrition therapy

Master Degree in Pharmacology and Experimental Therapeutics

1704700- Department of Pharmacology

Admission Requirements: Graduate students with a B.Sc. of Pharmacy or M.B.Ch.B.of Medicine.

Core Courses (26 Cr): 1704701, 1704702, 1704703,1704704,1704705, 1704706, 1704707, 1701720, 1701723, 1703721, 1721720.

Elective Courses (4 Cr): 1706720, 1707720, 1708720, 1720721, 1713720

M.Sc. Thesis: (8 Cr)

Core courses (26 Cr)

Code	Name	Hour /week		
		Theoretical	**Practical**	**Total Cr**
1704701	Graduate pharmacology	4	--	4
1704702	Clinical pharmacology & Therapeutics I	3	--	3
1704703	Therapeutics in special patient groups	4	--	4
1704704	Methods in Pharmacology	1	2	2
1704705	Autacoids and their antagonists	2	--	2
1704706	Toxicology	2	--	2
1704707	Advanced topics in pharmacology I	2	--	2
1701720	Biochemistry	1	2	2
1701721	Molecular biology	1	2	2
1703721	Physiology	1	--	1
1721720	Medical statistics	1	2	2
		22	**8**	**26**
Elective Courses (4 Cr)				
1706720	Bacteriology	1	2	2
1707720	Parasitology	1	2	2
1708720	Immunology	1	2	2
1720721	Computer	1	2	2
1713720	Genetics	1	2	2

Doctor of Philosophy in Pharmacology and Experimental Therapeutics

1704800- Department of Pharmacology

Admission Requirements: Postgraduate students with M.Sc. or an equivalent degree in Pharmacology or Pharmacology and Experimental Therapeutics of the Faculty of Medicine or Pharmacy.

Core Courses (21 Cr): 1704801, 1704802, 1704803, 1704804, 1704805, 1704806, 1701822, 1701821, 1703821, 1721820.

Elective Courses (3 Cr): 1706820, 1707820, 1708820, 1721821, 1713820.

Ph.D. Thesis: (24 Cr).

Core courses (21 Cr)

Code	Name	Hour /week		
		Theoretical	**Practical**	**Total Cr**
1704801	Clinical pharmacology & Therapeutics II	3	--	3
1704802	Therapeutics in high risk patients	3	--	3
1704803	Neuropharmacology	2	--	2
1704804	Advanced topics in pharmacology II	2	--	2
1704805	Recent advances in chemotherapy	3	--	3
1704806	Clinical pharmacokinetics	2	--	2
1701822	Biochemistry	1	--	1
1701821	Molecular biology	1	--	1
1703821	Physiology	1	--	1
1721820	Medical statistics	2	2	3
		20	**2**	**21**
Elective Courses (3 Cr)				
1706820	Bacteriology	2	2	3
1707820	Parasitology	2	2	3
1708820	Immunology III	2	2	3
1720823	Computer	2	2	3
1713820	Human Genetics	2	2	3

Description Courses offered by Clinical Pharmacology Department

1704701 Graduate pharmacology	**Hour/week**		
	Theoritical	**Practical**	**Total Cr**
	4	**-**	4

- Drug receptors and neurotransmitters in peripheral and central nervous systems and diseases associated with disturbances of those transmitters
- An overview on classes of autonomic drugs.
- Basis of pharmacokinetics
- Basis of pharmacodynamics.
- Drug abuse.
- An overview on corticosteroids, sex hormones and their antagonists

1704702 Clinical pharmacology and therapeutics I	**Hour/week**		
	Theoritical	**Practical**	**Total Cr**
	3	**-**	**3**

Basis of pharmacotherapy in patients with hypertension and congestive heart failure and ischemic heart diseases Basis of pharmacotherapy in bronchial asthma cases. Basis of pharmacotherapy in GIT diseases including peptic ulcer cases. Basis of pharmacotherapy in gout andrheumatoid arthritis pain managemen. Management of seizures

1704703 Therapeutics in special patient group	**Hour/week**		
	Theoritical	**Practical**	**Total Cr**
	4	**-**	**4**

The basis of therapeutics in pediatrics population (neonates, infants, children). The basis of therapeutics during pregnancy. The basis of therapeutics during lactation. The basis of therapeutics in geriatric population. The basis of therapeutics in patients with thyroid disorders and renal disorders immunocompromised and obese patients

1704704 Methods in pharmacology	**Hour/week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Routes of administration. Solutions and buffer. Blood sampling Drug development. Oxidative stress. Precautions for practical pharmacology. Laboratory skills Pharmacologic models of disease. Practical examplec:Standard curve of glutathione and glutathione in rat liver. Principles of good experimental design

1704705 Autacoids and their antagonists	**Hour/week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Allergy and antihistaminics. Antiserotonins. Cytokines. Eicosanoids and NSAIDs. polypeptides(angiotensins and kinins). Vasopressin, vasoactive intestinal peptides, neurotensin, substance P).Nitric acid

1704706 Toxicology	**Hour/week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Descriptive toxicity testing. Pediatric and geriatric toxicity . Forensic toxicology. Mutagenesis. Carcinogens. Teratogenesis, Toxicology of heavy metals . Toxicity of gase. Animal and plant toxins

1704707 Advanced topics in pharmacology

Hour/week		
Theoritical	**Practical**	**Total Cr**
2	-	2

Pharmacogenetics. Basis of immunopharmacology. Control of hyperglycemia and hyperlipidemia. Role of pharmacology in Mixed bacterial infections. Viral infections. Fungal infections. Herbal products

1704801 Clinical; pharmacology and therapeutics II

Hour/week		
Theoretical	**Practical**	**Total Cr**
3	-	3

Therapeutics in CV diseases. Therapeutics in bronchial asthma patients. Therapeutics in GI diseases. Therapeutics in some joint disorders(gout, rheumatoid arthritis). Therapeutics in hematopoietic disorders (anemia, clotting disorders)

1704802 Therapeutics in high risk patients

Hour/week		
Theoretical	**Practical**	**Total Cr**
3	-	3

Drug use in neonates, infants, and children: kinetic and dynamic considerations and principles of drug use. Drug use in pregnant women : role of placenta, teratogenic drugs, principles of drug use during pregnancy. Drug use during lactation:Drug transfer from plasma to breast milk, assessment of drug safety during breast feeding. Drug use in geriatric patients:kinetics and dynamic considerations, principles of drug use, adverse reactions in eldery patients. Drug use in patients with thyroid disorders: principles of drug use in hypo- and hyperthyroidism. Drug use in athletes, in diabetic patients and in renal disorders.

1704803 Neuropharmacology

Hour/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Drugs and autonomic nervous system. Management of epilepsy and parkinsonism. And Alzheimer's disease. Anxiety and depression: drug treatment. Drugs and schizophrenia.Pain Drug Abuse. Hypothalamic-pituitary adrenal axis

1704804 Advanced topics in pharmacology

Hour/week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Gene therapy. Principles of immunopharmacology. Current therapy of diabetes mellitus and hyperlipidemia. Current therapy of hypo and hyperthyroidism and osteoporosis. An overview on antibacterial , antifungal and antiviral agents

1704805 Recent advances in chemotherapy

Hour/week		
Theoretical	**Practical**	**Total Cr**
3	-	3

Animal models of malignant tumours. Drug therapy of solid tumours. leukemias :types. Drug therapy of acute and chronic leukemia. Drug therapy of solid tumours. Cancer stem cell chemotherapy. Mechanisms of cancer drug resistance Management of patients receiving cytotoxic chemotherapy

1704806 Clinical pharmaco-kinetics

Hour/week		
Theoretical	**Practical**	**TotalCr**
2	-	2

Basic considerations: absorption, distribution, biotransformation and excretion. One compartment versus two compartments model. calculation of pharmacokinetics parameters using :Plasma drug conc. Data urine drug conc. Data. Dosage regimens. Concentration versus time curves. Therapeutic drug monitoring

1704620 Pharmacology

Hour/week		
Theoretical	**Practical**	**TotalCr**
1	-	1

Basis of pharmacokinetics and pharmacodynamics.Anticoagulant drugs, Antimicrobial drugs, Antiviral drugs, Antibiotics, Antifungal, Antiplatelets drugs

1704720 Pharmacology

Hour/week		
Theoretical	**Practical**	**TotalCr**
1	2	2

General introduction to pharmacology to acquaint students with the action of drugs on physiological and biochemical functions. Routes of drug administration.Factors that affect blood levels of drugs; absorption, distribution, metabolism and excretion will be considered together with the mechanisms by which drugs act and their potential uses.drug interactions and adverse drug reactions. The course includes lectures, demonstrations and laboratory exercises designed to give students experience in the effect of drugs on organ systems and on intact conscious animal models.

1704820 Pharmacology

Hour/week		
Theoretical	**Practical**	**TotalCr**
2	2	3

An advanced course covering the basic principles of pharmacology (pharmacokinetics and pharmacodynamics). The mechanisms of pharmacological actions of drugs, correlation with therapeutic uses to provide in-depth knowledge in specific areas of pharmacology, drug-drug interactions and adverse drug reactions, together with laboratory demonstrations and interactive lectures which will provide students with a practical knowledge of the principles applied to the design and analysis of experiments in integrative pharmacology.

1704822 Molecular pharmacology (Suspended)

Hour/week		
Theoretical	**Practical**	**TotalCr**
1	2	2

This course begins by reviewing binding and enzyme kinetics. Various cellular receptors and their physiology are discussed as well as the pharmacological agents used to define and affect the receptor's function. Students study the pharmacology of cell surface receptors and intracellular receptors.Also considered are the drugs that affect enzymes.

Diploma Degree in Blood Banking and Blood Transfusion

1705600 -Haematology Department

Core courses (25 Cr) : 1705601,1705603 ,1705604,1705711,1706621,1715621, 1705605

Elective courses(5Cr) : 1705610, 1704620, 1710620, 1708620, 1721620, 1716620

Core courses (25 Cr)

Code	Name	Hours/ Week		
		Theoretical	**Practical**	**Total Cr**
1705601	Blood banking	3	2	4
1705603	Laboratory techniques	3	2	4
1705604	Clinical transfusion	3	2	4
1705711	Hematological immunology	3	2	4
1706621	Hematological microbiology	2	4	4
1715621	Internal medicine	2	2	3
1705605	Hematological cell biology	2	-	2
		18	**14**	**25**
Elective Courses (5 Cr)				
1704620	Pharmacology	1	-	1
1705610	Experimental haematology	1	-	1
1710620	Pathology	1	-	1
1708620	Immunology	1	-	1
1721620	Medical statistics	1	-	1
1716620	Infection control	1	-	1

Medical Doctor in Clinical Haematopathology

1705800-Department of Haematopathology

Admission Requirements: Postgraduate students with a M.Sc or an equivalent degree in Clinical Haematopathology , Clinical Pathology, Internal Medicine, or Paediatrics.

Core Courses (21 Cr): 1705801, 1705802,1705803,1705804,1705805, 1705806, 1705807b, 1705807c, 1705807d, 1705808a, 1705808b , 1705809a, 1705809b

Elective Courses (3 Cr): 1705810, 1706820, 1710820, 1715821,1718824,

M.D Thesis: (24 Cr)

Core courses: **(21 Cr)**

Code	Name	Hours/Week		
		Theoretical	**Practical**	**TotalCr**
1705801	Hematological cell biology	1	-	1
1705802	Hematological immunology	1	-	1
1705803	Hematological molecular biology	1	-	1
1705804	Hematological cytogenetics	1	2	2
1705805	Pharmacology of hematological chemotherapy	1	-	1
1705806	Basic laboratory technique	1	2	2
1705807a	Laboratory haematopathology a	-	2	1
1705807b	Laboratory haematopathology b	1	2	2
1705807c	Laboratory haematopathology c	1	2	2
1705807d	Laboratory haematopathology d	1	2	2
1705808 a	Clinical benign haematology a	1	-	1
1705808 b	Clinical benign haematology b	1	2	2
1705809 a	Clinical malignant haematology a	1	-	1
1705809 b	Clinical malignant haematology b	1	2	2
		13	16	21
Elective Courses (3 Cr)				
1705810	Experimental haematology	1	1	1.5
1706820	Bacteriology	2	2	3
1710820	Pathology	2	2	3
1715821	Internal medicine	1	1	1.5
1718824	Radiodiagnosis	1	1	1.5

Description of the Courses Offered by Haematology Department

1705601 Blood banking

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Blood Donation .
- Blood and plasma components .
- Collection of Blood by cell separators.
- Stem cell donation.
- Plasma and RBC substitutes.
- Principles and criteria of quality management

1705603 Laboratory techniques

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- The blood bank equipments
- Preservation & maintaining a cold chain. ELISA.
- Compatability test.
- Screening tests on recipient s and donor serum.
- Tests for hemolytic transfusion

1705604 Clinical transfusion

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Cytapheresis.
- Plasmapheresis.
- Transfusion of anaemic and hemoglobinopathy patients.
- Transfusion to B.M or solid organ transplants recipients.
- Transfusion to platelet refractory patients.
- Complications of transfusion, •Management of complications.

1705605 Hematological cell biology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2		**2**

Haemopoietic stem cells, Composition & function of erythrocytes . Production & fate of erythrocytes, Red cell metabolism . Neutrophils, Eosinophilis, Basophilis, . Monocyte, Lymphocyte & plasma cells,
Megakaryopoiesis, Blood coagulation

1705610 Experimental Haematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	١	

Experimental animals (Strains – Inbred Syrains – Animal house). Hematologic differences from man.
Transplantation of leukemias & tumors. Types of leukemias in animals and differences from man. Use of expermental malignancy for screening of new chemotherapeutics & methods of treatment

1705711 Hematological Immunology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- General Immunology (Immune response).
- Immunoglobulin antigen-antibody reactions .
- HLA complex .
- Immunohematology: red cell antigens and blood group systems.
- Leucocyte and platelet antigens and antibodies.
- Complemented activation by blood group antibodies

1705801 Hematological cell biology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

- Hemopoietic stem cells.
- Erythrocytes, Iron metabolism,
- Metabolic aspects of folic acid & B12, Neutrophils, Eosinophils, Basophils, Mononuclear cells, Lymphocyte & plasma cells,
- Megakaryopoiesis & thrombopoiesis, Platelets, Coagulation factors & pathways of hemostasis,
- Control of coagulation reactions,
- Vascular function in hemostasis, Fibrinolysis, Transfusion medicine

1705802 Hematological immunology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

- The immune response
- B cell and immunoglobulins
- T cell and natural killer cells
- Major histocompatibility complex
- Mechanisms of hypersensitivity, Mechanisms of disordered immune regulation
  Mechanisms of tumor immunology , Clinical transplantation

1705803 Hematological molecular biology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

- Nucleic acid structure and function
- DNA organization and replication , RNA synthesis and processing,
- Recombinant DNA technology, Structure of the globin genes
- Cellular and viral oncogenes
- Molecular mechanism of hematological neoplasms
- Molecular technique

1705804 Hematological cytogenetics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Cell divison & principle of cytogenetics.Normal human chromosomes.
- Numerical&structural chromosomal abnormalities.
- karyotyping & molecular techniques.
- Cytogenetic abnormalities of acute myeloid leukemia and acute lymphatic leukemia
- Cytogenetic abnormalities of chronic lymphoproliferative disorders and CML.
- Cytogenetic abnormalities of myeloproliferative disorders and of MDS & 2ry leukemia
- Cytogenetic abnormalities of plasma cell dyscrasias and NHL .

1705805 Pharmacology of hematological chemotherapy	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	**1**

- Principles of drug disposition.
- Specific drug groups(Antimicrobials, Antineoplastic, Immunotherapy)
- Blood components.
- Antithrombotic + antiplatelets drugs
- Hemostatic drugs
- Target therapy

1705806 Basic laboratory technique

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Collection of blood &processing
- Anticoagulants, Buffers & solutions
- Units of measurements
- Instrumentation& Analytical procedures
- Complete blood picture
- Platelet function tests

1705807a Laboratory hematopathology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
-	2	1

- Types of anaemia,*Diagnostic tests for anaemias
- The morphological classification of anaemia
- specific tests for hemolytic anemia and cytochemical stains
- Hematologic reference values in newborn and pediatric**s**

1705807b Laboratory hematopathology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Diagnostic approach to bleeding disorders
- Laboratory diagnosis for a case of thrombocytopenia
- Laboratory diagnosis for a case of thrombocytosis
- Laboratory findings in inherited & acquired coagulation disorders

1705807c Laboratory hematopathology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Diagnostic approach to leukemia
- Diagnostic tests for myeloproliferative disorders
- Role of molecular techniques in acute leukemias
- Minimal residual disease

1705807d Laboratory hematopathology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Diagnostic approach of chronic lymphoproliferative disorders
- Laboratory findings in Hodgkin and non Hodgkin’s lymphoma
- Diagnostic approach in plasma cell dyscriasis
- Laboratory findings in Macroglobulinemia, Amyloidosis and cryoglobulinemia

1705808 (a) Clinical benign haematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1		1

- Iron deficiency anaemia & iron overload
- Megaloblastic anaemia & other macrocytic anaemias
- Aplastic anaemia & BM failure syndrome.Haemolytic anaemias.
- Stem cell transplantation in benign hematological diseases
- Bleeding & coagulation disorders,Thrombosis & antithrombotic therapy
- Blood transfusion and Pregnancy & neonatal haematology

1705808b Clinical benign haematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Quantitative platelet disorders -Thrombocytopenia(destruction and loss)
- Qualitative platelet disorders(acquired and inherited)
- Bleeding & coagulation disorders,Thrombosis & antithrombotic therapy
- Blood transfusion and Pregnancy & neonatal haematology

1705809a Clinical malignant haematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1		1

- Pre leukemia and myelodysplastic syndrome.***** Classification of leukemias
- Acute myeloid leukemias, *Acute lymphoid leukemias
- Chronic myeloproliferative disorders
- Bone marrow transplantation, Supportive therapy in hematologic malignancies

1705809 b Clinical malignant haematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Chronic lymphoproliferative disorders
- Plasma cell dyscrasias and related disorders
- Macroglobulinemia
- Amyloidosis , Cryoglobulins and cryoglobulinemia

1705810 Experimental Haematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	1	1.5

- Experimental animal(Strains – Inbred Strains -Animal house)
- Hematologic differences from man
- Transplantation of leukemias & tumors
- Types of leukemias in animals and differences from man
- Use of experimental malignancy for screening of new chemotherapeutics & methods of treatment

1705820 Hematology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Haemopoiesis. The white cells & their benign disorders. The Spleen. Pathogenesis& classification of anaemias. Hypochromic anaemias& iron overload. Megaloblastic anemias & other macrocytic anaemia Haemolytic anaemia. Aplastic anaemia & bone marrow failure

1705720 Hematology

Hour/Week		
Theoretica	**Practical**	**Total Cr**
1	2	2

Haemopoiesis, The white cells & their benign disorders,The Spleen,Pathogenesis& classification of anaemias, Hypochromic anaemias& iron overload, Megaloblastic anemias & other macrocytic anaemia,
Haemolytic anaemia, Aplastic anaemia & bone marrow failure.
Acute leukemias Chronic leukemias,Haematological changes in systemic disease, Normal hemostasis, Coagulation disorders

Master Degree in Diagnostic and Molecular Microbiology

1706700 -Department of Microbiology

Admission Requirements: Graduate Students With a M.B.Ch.B.of Medicine, B.Sc.of Pharmacy, Dentistry, Veterinary, or Science.

Core Courses (26 Cr): 1706701, 1706702, 1706703, 1706704, 1706705,1706706, 1706707, 1706709, 1706710, 1706711, 1706712, 1708720, 1721720.

Elective Courses (4 Cr):1706708, 1706713, 1701720 ,1704720, 1707720, 1710720,1700780, 1709740, 1717720.

M.Sc. Thesis: (8Cr)

Core courses (26Cr)

Code	Name	Hours/Week		Total Cr
		Theoretical	Practical	
1706701	Medical Bacteriology	4	--	4
1706702	Medical Virology	4	--	4
1706703	Medical Mycology	1	2	2
1706704	Microbial Genetics	1	--	1
1706705	Molecular Diagnostic Microbiology I	2	2	3
1706706	Molecular Laboratory Techniques I	--	2	1
1706707	Special Topics in microbiology I	1	--	1
1706709	Biosafety & Infection Control	1	--	1
1706710	Microbiology of Antimicrobial Agents	2	--	2
1706711	Microbial Pathogenesis	1	--	1
1706712	Microbiology Laboratory Techniques I	1	2	2
1708720	Immunology	1	2	2
1721720	Medical Statistics	1	2	2
		20	12	26

Elective Courses (4 Cr)

1706708	Infectious Diseases	2	-	2
1706713	Mycology	4	-	4
1701720	Biochemistry	1	2	2
1704720	Pharmacology	1	2	2
1707720	Parasitololgy	1	2	2
1710720	Pathology	1	2	2
1700780	Clinical Epidemiology I	2	-	2
1709740	Basics in Laboratory Animal Science	1	2	2
1717720	Chemical Pathology	1	2	2

Master Degree In Infection Control & Management

170790 – Department of Microbiology

Admission requirements: Graduate students with bachelor of medicine, science, nursing, dentistry, pharmacy, veterinary or equivalent degrees from an accredited university

Core Courses (26 Cr): 1706791, 1706792, 1706793, 1706794, 1706795, 1706796, 1706797, 1706798, 1706799, 1706800,1706808

Elective Courses (4Cr) : 1706720, 1707720, 1708720, 1717720
M.Sc. Thesis : (8Cr)
Core courses: (26 Cr)

Code	Name	Hours/Week		
		Theoretical	**Practical**	**Total**
1706791	Introduction & goals of IC	2	**-**	2
1706792	Organization	2	**-**	2
1706793	Role of microbiology department in IC	2	2	3
1706794	Hospital environment 1	2	2	3
1706808	Hospital environment 2	2	2	3
1706795	occupational safety &employee health	1	-	1
1706796	Hygiene and decontamination	2	2	3
1706797	Antimicrobial resistance	1	-	1
1706798	Health care associated infection(HAIs)and its prevention	3	2	4
1706799	Surveillance of Health Care Associated Infections	2	-	2
1706800	Common organisms causing nosocomial infection	2	-	2
		21	10	26

ElectiveCourses: (4Cr)

		Hours/Week		
		Theoretical	**Practical**	**TotalCr**
1706720	Bacteriology	**1**	**2**	2
1707720	Parasitology	1	**2**	2
1708720	Immunology	1	**2**	2
1717720	Chemical Pathology	1	**2**	2

Doctor of Philosophy in Diagnostic and Molecular Microbiology

1706800 - Department of Microbiology

Admission Requirements: Postgraduate Students With a M.Sc.or an equivalent dgree in Diagnosti Molecular Microbiology, Medical Microbiology and Immunology, or Pharmaceutical Microbiology

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Core Courses (20 Cr): 1706801 ,1706802 ,1706803 ,1706804 ,1706805, 1706806 .

Elective Courses (4 Cr): 1706807,1701820,1704820,1707820,1708820,1710820,1709840, 1700880,1717820 .

Ph.D. Thesis: (24Cr)

Core courses (20Cr)

Code	Name	Hours/Week		
		Theoretical	**Practical**	**Total Cr**
1706801	Advanced Medical Bacteriology	4	-	4
1706802	Advanced ٥٥Medical Virology	4	-	4
1706803	Molecular Diagnostic Microbiology II	3	٢	4
1706804	Techniques II Microbiology Laboratory	-	4	2
1706805	Molecular Laboratory Techniques II	1	4	3
1706806	Special Topics in microbiology I*I*	3	-	3
		15	**10**	**20**
Elective Courses (4 Cr)				
1 706807	Advanced Mycology	2	2	3
1701820	Biochemistry	2	2	3
1704820	Pharmacology	2	2	3
1707820	Parasitololgy	2	2	3
1708820	Immunology	2	2	3
1710820	Pathology	2	2	3
1709840	Advanced Laboratory Animal Science	1	2	2
1700880	Clinical Epidemiology II	2	-	2
1717820	Chemical Pathology	2	2	3

Description of the Courses Offered by Diagnostic and Molecular Microbiology Department

1706701 Medical Bacteriology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
4	--	4

This course is designed to give the student insight into the fundamentals of microbiology with emphasis on its relation to human biology and disease. The course covers the basic properties of microorganisms. The microorganisms studied in this course include the bacteria, mycoplasmas, rickettsiae, chlamydiae. The student will learn the concepts of microbiology and the application of microbiological techniques in the identification of infectious agents for diagnostic and research purposes.

1706702 Medical Virology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
4	-	4

The course provides an introduction to Medical Virology. It aims to teach the fundamental basis of the virus life style, the ground rules of viral pathogenesis, and covers the following general areas: viral structure, classification, replication; sequential steps in viral infection; viral virulence; viral persistence, virus cell interactions, viral oncogenesis, antiviral drugs; and methods of prevention and control of viral diseases. It provides a comprehensive understanding of laboratory diagnosis of medically important viruses; DNA viruses; RNA viruses; retroviruses; hepatitis viruses; prions; oncogenic viruses; and role of viruses in disease.

1706703 Medical Mycology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Basic knowledge in medical mycology as regarding morphology, taxonomy, classification of the fungi. Detection and recovery of fungi from clinical specimens. The course is designed to give insight on dermatophytes and agents of superficial mycoses, yeasts of medical importance, dimorphic fungi causing systemic mycoses.
Detailed study on experimental methods used in direct examination, isolation and identification of superficial mycoses, yeast infection, aspergillosis and serodiagnosis of fungal infection.

1706704 Microbial Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

The aim of the course is to let student understand the fundamentals of bacterial genetics and to provide basic knowledge regarding the structures of eukaryotic and prokaryotic genes, the structures of nucleic acids, the processes of DNA replication, the processes of transcription and translation, the mechanisms of gene transfer, the mechanisms of gene expression, mechanism of genetic exchange and mutation. The course will include in-depth study on bacterial resistance and the different mechanism of transfer of bacterial resistance.

1706705 Molecular diagnostic microbiology **I**

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

The aim of the course is to provide the student with knowledge in molecular laboratory techniques used in isolation, identification of microbial pathogens including methods of DNA and RNA extraction from clinical specimen and amplification techniques. The course focuses on DNA Replication, transcription and translation, protein synthesis, mutations, mobile DNA, ,plasmids, recombinant DNA technology, molecular typing, polymerase chain reaction (PCR), real time fluorescent PCR, branched DNA, transcription mediated amplification, ligase chain reaction, site directed mutagenesis, gene expression, DNA microarrays and sequencing.

1706706 Molecular laboratory techniques1

Hours/Week		
Theoretical	**Practical**	**Total Cr**
--	2	1

The aim of the course is to provide the students with skills and hands on experience in basic molecular laboratory techniques used in diagnostic medical microbiology including DNA and RNA purification techniques , gel electrophoresis, plasmid preparation, Blotting techniques, hybridization techniques, polymerase chain reaction techniques and real time polymerase chain reaction.

1706707 Special Topics in microbiology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

Integrated academic training with current research in microbiology, immunology, and infectious diseases. Students will present results of state of the art investigations of microbial diseases of public health significance, emphasizing experimental design and methodology for analysis and discussion.

1706708 Infectious Diseases

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

The purpose of this section is to provide general considerations about the epidemiology of the infectious agents and the clinically important viral, bacterial and fungal diseases. Special emphasis will be given to upper respiratory tract infection , pneumonia :community & hospital acquired, urinary tract infection, gastro intestinal tract infection, surgical wound infection, sepsis, sexually transmitted diseases, meningitis, hepatitis, tuberculosis, AIDS,fever of unknown origin, food borne infection, water borne infection and zoonosis

1706709 Bio-safety and infection control

Hours/Week		
Theoretical	**Practical**	**TotalCr**
1	--	1

This course is designed to give the student insight into principles and practices of infection control and the benefit of adhering to scientifically acceptable infection control measures to patients & healthcare workers. The course describe how pathogenic organisms can spread in the lab and how infection control concepts are applied in professional practice also the policies for handling of infectious materials and adherence to good lab practices, risk of laboratory infections with blood-borne pathogens, environmental safety and safety consciousness of employees, strategies for effective disinfection and sterilization of lab environment, instruments &devices.

1706710 Microbiology of antimicrobial agent

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	--	2

The purpose of this section is to provide general considerations about antimicrobial susceptibility testing. Knowledge of the inherent in vitro susceptibility of the infecting organism to appropriate antimicrobial agents. The relationship of the susceptibility of the strain to that of other members of the same species. Influence of technical variation on susceptibility test results. Indications for susceptibility tests in the clinical laboratory.To study the nature and mode of action of different antimicrobial agents and the mechanism of bacterial resistance to these agents

1706711 Pathogenesis Microbial	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

This course is designed to give the student basic knowledge about normal flora, host parasite relationship, infectious process, virulence determinants and antimicrobial defense of the host. The course will cover the molecular aspects of microbial pathogenicity. The pathogenic properties of bacteria and other microorganisms will be discussed. Special emphasis will be given to the molecular and genetic aspects that are relevant to the epidemiology of infectious diseases.

1706712 Microbiology Laboratory Techniques1	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Laboratory training and exercises in microbiological techniques. To complete the knowledge acquired in Medical Microbiology with practical skills in diagnostic techniques. On completion of the course, the student will be able to isolate and identify significant bacteria from clinical specimens and investigate antimicrobial resistance .

1706713 Mycology	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	4	--	4

The course aim to provide students with basic knowledge in medical mycology as regarding Fungi and their general properties, morphology, taxonomy, classification of the fungi, detection and recovery of Fungi from clinical specimens. The course is designed to give insight on dermatophytes and agents of superficial mycoses, yeasts of medical importance, dimorphic fungi causing systemic mycoses, recognize opportunistic mycoses, recognize the mode of action of different antifungal agents.

1706801 Advanced Medical Bacteriology	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	4	--	4

This course is designed to give the student in- depth study of bacterial structure and replication including cell wall components, cytoplasmic organelles, and bacterial classification. The course will provide detailed study of the pathogenic bacteria including mycoplasmas, rickettsiae and chlamydiae. The student will learn the application of microbiological techniques in the identification of infectious agents for diagnostic and research purposes.

1706802 Advanced Medical Virology	**Hours/Week**		
	Theoretical	**Practical**	**TotalCr**
	4	--	4

An in depth course devoted to the field of virology with special emphasis on the architecture and characteristics of viruses, the infectious cycle, and the replication of viral nucleic acids. The process of viral attachment, penetration, bio-synthesis of viral components, assembly and release of viruses from host cells. The mechanism of viral pathogenesis and host response to viral infection. The course will provide a comprehensive critical practice in the diagnostic strategies for viral disease.

1706803 Molecular Diagnostic Microbiology I	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

The course will provide detailed theoretical guidance in the application of molecular techniques such as ribotyping, PFGE, hybridization and nucleic acid amplification methods in the detection, identification and typing of microorganism and in the detection of antibiotic resistance and virulence genes. The course will help to elucidate the clinical and epidemiologic relevance of molecular techniques and their impact on clinical bacteriology.

1706804 Microbiology lab technique II

Hours/Week		
Theoretical	**Practical**	**Total Cr**
-	4	2

The course will be provided to acquaint the student with experimental techniques necessary for in depth studies on bacteria, competence in the use of relevant laboratory equipment and the ability to master, with appropriate training, new experimental techniques. Attention will be given to isolation and identification of non conventional pathogen , detailed identification of infecting organism for epidemiologic tracing bioassay and enzymatic assay techniques.

1706805 Molecular laboratory techniques I*I*

Hours/Week		
Theoretical	**Practical**	**Total Cr**
١	٤	٣

The aim of the course is to provide the students with skills and hands on experience in new molecular laboratory techniques used in diagnosis and research in the field of medical microbiology including cloning technique, nucleic acid blotting techniques, southern blot and northern blot, western Blot, molecular typing: restriction fragment length polymorphism (RFLP), pulse field gel electrophoresis (PFGE), random amplified polymorphic DNA (RAPD) and variable number tandem repeats (VNTR) and Real Time PCR

1706806 Special Topics in microbiology I

Hours/Week		
Theoretical	**Practical**	**TotalCr**
3	-	3

Up to date studies and presentations that include genetic, biochemical, biophysical, bioinformatic and structural analysis leading to a deeper understanding of the molecular principles underlying basic physiological processes or mechanisms of pathogenicity and virulence, interactions of pathogens and their products with eukaryotic host cells, Cell to cell communication and signalling pathways.

1706807 Advanced Mycology

Hours/Week		
Theoretical	**Practical**	**TotalCr**
1	2	2

The course aim to provide detailed study of medical mycology as regarding morphology, taxonomy, classification of the fungi, detection and recovery of Fungi from clinical specimens. The course is designed to give detailed and in-depth study on dermatophytes and agents of superficial mycoses, yeasts of medical importance, dimorphic fungi causing systemic mycoses, recognize opportunistic mycoses, recognize the mode of action of different antifungal agents.Study of the laboratory methods and interpretation used in diagnostic mycology including modern techniques in diagnostic mycology.

1706791 Introduction & goals of **IC**

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	**-**	**2**

he aim of this course is to give an introduction to the growing importance of infection control management and the deployed governmental strategy to implement infection control guidelines and norms in all related environments.
On the other hand the goals of infection control are to prevent adverse effect, protect staff and visitors, reduceinfection rates and maintain surveillance.

1706792 Organization

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- The course will clarify the role of the management identifying its commitment towards infection control policy ,
- The steps for proclaiming funds for the infection control requirements as well as maintaining constant surveillance.

1706793 Role of microbiology department in IC	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

This course will discuss the central role of the microbiology department in infection control as regard : ensuring that lab practices meet the appropriate standards (collection of samples ,identification of pathogen etc…) , monitor and report trends in prevalence of bacterial resistance to antimicrobial agents, emergence of unusual pathogen and how the lab participate in activities of the Antimicrobial Use Committee

1706794 Hospital environment **1**	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Purpose: This course intends to focus on the adequate measurements regarding hospital waste management and on the impact of building, equipment design and the hospital environmental services on infection prevention and control in health care environment.

1706808 Hospital environment **2**	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Purpose: This course intends to identify sound infection control practices used in the high risk health care settings to prevent, reduce and control Health-care associated transmission of infectious organisms.

1706795 Occupational safety &employee health	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

This course will deal with the possible occupational injuries and the proper measurements that should be applied in case of occurrence. Meanwhile, the course will cover the safety measures that should be taken into considerations in the various areas of potential infection such as: patient area, food, pharmacy, operating rooms, emergency rooms & receiving areas, laboratories, as well as dental and obstetric environments.

1706796 Hygiene and decontamination	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

This course aims to specify the means of decontaminating instruments, work surfaces, waste-contaminated materials as well as maintaining wide margins of safety for the involved personnel in the decontamination team.

1706797 Antimicrobial resistance	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

By the end of this course, students should be aware of the different groups of antibiotics, antimycotics, antiviral & antimicrobial agents in practice . The course intends to focus on the relation of improper antibiotic use to the development antibiotic resistance and its spread among bacteria and will clarify the role of antimicrobial control policy in prevention and infection control.

1706798 Health care associated infection and its prevention

Hours/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

This course focuses on the common diseases caused by infection such as tuberculosis, diarrhea, pneumonia, urinary tract infection ,hepatitis .
Meanwhile consequently to some procedures infection occurs such as after the use of mechanical ventilation, vascular and urinary tract catheters.

1706799 Surveillance of health care associated infection

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

This course aims to clarify the importance of surveillance as an effective process to decrease the frequency of HAI , Tthe different methods of surveillance and key points for incorporation of HAI surveillance plan

1706800 Common organisms causing Health care associated infection

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

The objective of this course is to introduce to the students the common organisms causing HAI infection specially those are antibiotic resistant ,their mode of transmission , the patient risk factors, preventive and specific control measures for containment of outbreaks due to these organisms, and specific control measures in case of accidental exposure to certain pathogens..

1706621 Hematological Microbiology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	4

Classification of viruses. Diagnosis of infections agents transmitted by transfusion,. Cultures . Disinfection . Sterilization, Hospital acquired infection

1706720 Bacteriology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

This course is designed to give the student insight into the fundamentals of microbiology with emphasis on its relation to human biology and disease.
The student will learn the application of microbiological techniques in the identification of infectious agents for diagnostic and research purposes. The pathogenic properties of bacteria and other microorganisms will be discussed.
Special emphasis will be given to the molecular and genetic aspects that are relevant to the epidemiology of infectious diseases.

1700780 Clinical Epidemiology I

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

This course is designed to give the student insight into the principles and methods involved in studying the outcome of illness. Infectious diseases from a public health perspective. Topics include analytic methods, study design, outbreak investigations, surveillance, vaccine evaluations, global eradication, screening, modeling, and infectious causes of chronic diseases.
Special emphasis will be given to the molecular and genetic aspects that are relevant to the epidemiology of infectious diseases.

1706820 Bacteriology	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

An in depth course devoted to the field of microbiology with special emphasis on the architecture and characteristics of different microorganisms, the infectious cycle, and the replication. The course will provide detailed study of the pathogenic microorganisms and their relation to infectious diseases. The student will learn the application of the updated microbiological techniques in the identification of infectious agents for diagnostic and research purposes.

1700880 Clinical Epidemiology II	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2		2

An in depth course devoted to the field of clinical epidemiology. In this course, the principles and practice of clinical epidemiology will be considered and examples from the literature will be worked out and discussed with special emphasis on evaluating the accuracy of a given diagnostic or screening test, the approaches to evaluating the degree to which a test can lead to improved health outcomes, and judging, when it is appropriate to employ those approaches. Also, the course will describe the characteristics of a given randomized trial of therapy that are needed to enhance validly and maximize generalizability. The student will learn how to characterize those situations in which nonrandomized studies have the potential to generate valid estimates of therapeutic efficacy and to identify elements of nonrandomized studies that allow for an accurate indication of a treatment's unanticipated effects.

Diploma Dregree in Experimental and Clinical Parasitology

1707600 - Department of Parasitology

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine.

Core Courses: (26 Cr)**:** 1707601, 1707602, 1707603, 1707604, 1707605, 1707606, 1707607, 1707609.

Elective Courses (4 Cr)**:** 1707610, 1707611,1707612, 1707613, 1707614, 1707615, 1721620, 1707640

Core courses (26 Cr)

Code	Name	Hours / Week		
		Theoretical	**Practical**	**Total Cr**
1707601	Parasitology (a)	3	2	4
1707602	Parasitology (b)	3	2	4
1707603	Clinical Parasitology (a)	2	2	3
1707604	Clinical Parasitology (b)	2	2	3
1707605	Diagnostic Parasitology (a)	2	4	4
1707606	Diagnostic Parasitology (b)	2	4	4
1707607	Treatment of Parasitic Infections	2	-	2
1707609	Experimental Parasitology	1	2	2
		17	**18**	**26**
Elective Courses (4 Credit Hours)				
1707610	Immunology of Parasitic Infections (a)	1	-	1
1707640	Fundmintal in lab animal science	1	2	2
1707611	Epidemiology of Parasitic Infections (a)	1	-	1
1707612	Field Studies	1	-	1
1707613	In Vitro Cultivation (a)	1	-	1
1707614	Quality Control (a)	1	-	1
1707615	Electron Microscopic Studies of Parasites (a)	1	-	1
1721620	Medical Statistics	1	-	1

Master Degree in Applied & Molecular Parasitology

1707700-Department of Parasitology

Admission Requirements: Graduate students with a M.b.Ch.B of medicine,B.Sc. of Veterinary,
Pharmacy, Science, or Agriculture.

Core Courses (24 Cr): 1707701,1707702,1707703,1707704,1707705,1707706,1707713, 1721720

Elective Courses (6 Cr):1707707,1707708,1707709,170740,1707711,1707712,1701720, 1705720, 1708720 .1710720,,1706720,

M.Sc. Thesis : (8 Cr)

Core courses (24 Cr)

Code	Name	Hours/ Week			
		Theoretical	**Practical**	**Field**	**Total Cr**
1707701	Parasitology I	3	2	-	4
1707702	Parasitology II	3	2	-	4
1707703	Diagnostic Parasitology I	2	4	-	4
1707704	Diagnostic Parasitology II	1	2	-	2
1707705	Immunology of Parasitology	2	-	-	2
1707706	Epidemiology of Parasitic diseases	2	-	8	4
1707713	Molecular Parasitology	1	2	-	2
1721720	Medical Statistics	1	2	-	2
		15	**14**	**8**	**24**
Elective Courses (6 Cr)					
1707707	Clinical Parasitology I	1	2		2
1707708	Clinical Parasitology II	1	-		1
1707709	Treatment of Parasitic Infections	1	-		1
170740	Basics in Laboratory Animal Science	1	2		2
1707711	Experimental Parasitology	1	2		2
1707712	Biomedical Research Ethics	2	-		2
1701720	Biochemistry	1	2		2
1705720	Hematology	1	2		2
1708720	Immunology	1	2		2
1710720	Pathology	1	2		2
1706720	Bacteriology	1	2		2

Doctor of Philosophy in Applied & Molecular Parasitology

1707800-Department of Parasitology

Admission Requirements : Postgraduate students with a M.Sc. or an equivalent degree in Applied Parasitology , Parasitology , or Tropical Medicine.

Core Courses (17Cr) : 1707801 , 1707802 , 1707803 , 1707804 , 1707805 , 1707806,1707813 , 1707814 .

Elective Courses (7 Cr)1707808,1707809,1707807 , 1704820 , 1705820 , 1708820 , 1710820, 1707810 ,1707811 ,1707812 , ,1701820 ,1706820 ,1720823 ,

Ph.D. Thesis : (24 Cr)

Core courses (17 Cr)

Code	Name	Hours/ Week			
		Theoretical	**Practical**	**Field**	**Total Cr**
1707801	Avanced Parasitology I	2	2	-	3
1707802	Avanced Parasitology II	2	2	-	3
1707803	Zoonosis	2	-	-	2
1707804	Host-Parasite Relationship	2	-	-	2
1707805	Field Studies	1	-	4	2
1707806	Quality Control	1	-	-	1
1707814	Prevention and Control of Parasitic diseases	2	-	-	2
1707813	Advanced Molecular Parasitology	1	2	-	2
		13	**6**	**4**	**17**
Elective Courses (7 Cr) (for students with M.B.Ch.B of Medicine)					
1707808	Advanced Clinical Parasitology I	1	2		2
1707809	Advanced Clinical Parasitology II	1	-		1
1707810	Treatment of Parasitic Infections	1	-		1
1707811	Advanced Experimental Parasitology	2	2		3
1707812	In Vitro Cultivation	1	2		2
1707807	Malacology	2	2		3
1720823	Computer	2	2		٣
1701820	Biochemistry	2	2		3
1704820	Pharmacology	2	2		3
1705820	Hematology	2	2		3
1708820	Immunology	2	2		3
1710820	Pathology	2	2		3
1706820	Bacteriology	2	2		3

Description of the Courses Offered by Experimental and Clinical Parasitology Department

1707601 Parasitology (a)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Provide knowledge about helminthic parasitic diseases.
- Develop intellectual, practical and professional skills in diagnosis, treatment, prevention and control of different helminthic infections.

1707602 Parasitology (b)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Provide knowledge about protozoal parasitic diseases.
- Develop intellectual, practical and professional skills in diagnosis, treatment, prevention and control of different protozoal infections.
- Recognize the importance of arthropods as causative agents and vectors of diseases.

1707603 Clinical Parasitology (a)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Evaluate magnitude of parasitic infection in the morbidity and mortality of tropical diseases, identify prevalence among community and preventive measures.
- Obtain knowledge about the impact of parasitic infections in tropical diseases, their effect on different body systems, understanding pathogenic mechanisms in diseases and learning how to manage them.

1707604 Clinical Parasitology (b)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Recognize the multifaceted nature of parasitology, thereby, moving the study of this science from its initial emphasis on examination of life cycles and morphology of parasites to a more wider applied form on clinical basis.
- Provide practical and clinical skills as regards diagnosis and management of parasitic diseases.
- Recognize the clinical significance of parasites in humans including the potential interaction between infection with specific parasites and other agents.

1707605 Diagnostic Parasitology (a)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

- Understanding of the role of immunology in diagnosis of parasite infections.
- Promote the understanding of the different immunodiagnostic techniques used to identify parasites.
- Provide basic practical skills and experience on most commonly used laboratory techniques relevant to the study of parasites.

1707606 Diagnostic Parasitology (b)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

- Understanding of the role of immunology in diagnosis of parasite infections.
- Promote the understanding of the different immunodiagnostic techniques used to identify parasites.
- Provide basic practical skills and experience on most commonly used laboratory techniques relevant to the study of parasites.

1707607 Treatment of Parasitic Infections

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	--	2

- Provide basic knowledge on currently used and novel antiparasitic drugs
- Understand and recognize clinical pharmacology of different drugs.
- Assess chemotherapeutic response
- Mechanism of resistance – new drugs.

1707609 Experimental Parasitology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Studying the liefcycles of snail-borne helminthes.
- Studying the fresh-water snail biology, nutrition and care.
- Studying the fresh-water snails present in the Egyptian environment especially those of medical and veterinary importance

1707610 Immunology of Parasitic Infections

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Provide knowledge and understanding of the basic concepts and principles in immunology.
- Develop an understanding of the immunological defenses against parasitic infection.
- Understanding immunological aspects of a selected group of parasites.

1707640 Fundmantal in Laboratory AnimalScience

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

The course will present guidelines to care and use of laboratory animal according to international rules including;
-Laboratory animal facility,
-Husbandry of laboratory animal,
-Laboratory animal as a model of human disease,
-The biological testing and carcinogenesis,

1707611 Epidemiology of Parasitic Infections

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- To understand the process of epidemiologic investigation of parasitic diseases and to be able to apply it in practical settings.
- To Get Knowledge on the distribution and determinants of different parasitic infections.

1707612 Field Studies

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Estimate magnitude of the problem.
- Detect epidemics and define problem.
- Generate hypothesis, stimulate research and design a survey.
- Discuss and detect changes in health practices.
- Explain and facilitate planning

1707613 In Vitro Cultivation

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Cultural methods are good tools in investigation of various aspects of parasitology ex.
- Life cycle and transmission of parasitic diseases.
- Study of biochemistry, physiology and immunology of parasites inside the experimental host.
- Certain aspects of interaction between parasites and individual immune factors.

1707614 Quality Control

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Provide knowledge and understanding the history and terminology of quality control.
- Recognize the different tools of quality control.
- Provide basic practical skills for application of quality control in the diagnosis, treatment, prevention and control of different parasitic infections.

1707615 Ellectron microscopic studies of parasites (a))

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- To detect ultra structure of different parasites.
- To define impact of parasites on different organs at ultra structural level.
- Prepare and process samples for EM examination

1707701 Parasitology (I)

Hours/week		
Theoritical	**Practical**	**Total Cr**
3	2	4

- Provide knowledge about geographical distribution, morphological features, biological aspects, different hosts, life cycle and mode of transmission of helminthic parasites.
- Develop intellectual, practical and professional skills in clinical presentations, diagnosis, treatment, prevention and control of different helminthic infections.

1707702 Parasitology (II)

Hours/week		
Theoritical	**Practical**	**Total Cr**
3	2	4

- Provide knowledge about geographical distribution, morphological features, biological aspects, different hosts, life cycle and mode of transmission of protozoa.
- Develop intellectual, practical and professional skills in clinical presentations, diagnosis, treatment, prevention and control of different protozoal infections.
- Provide adequate knowledge about arthropods of medical importance and explain their role as causative agents and vectors for diseases.

1707703 Diagnostic Parasitology I

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	4	4

- Understand the general diagnostic considerations for specimen collection (the number and timing of specimens, timely transport to the laboratory and prompt examination).
- Estimate the clinical outcomes of the infections.
- Provide practical skills for fecal specimen collection and microscopic examination.
- Provide basic practical skills for different techniques of stool examination among high and low intensity cases.
- Develop the ability for diagnosis of parasitic examination infections of blood and tissue
- Provide practical skills for collection of specimens other than stool (urine, sputum).

1707704 Diagnostic Parasitology II

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	2	2

- Understanding of the role of immunology in diagnosis of parasite infections.
- Promote the understanding of the different immunodiagnostic techniques used to identify parasites.
- Provide basic practical skills and experience on most commonly used laboratory techniques relevant to the study of parasites.

1707705 Immunology of parasitic infections

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	-	2

- Provide knowledge and understanding of the basic concepts and principles in immunology.
- Develop an understanding of the immunological defenses against parasitic infection.
- Understanding immunological aspects of a selected group of parasites.

1707706 Epidemiology of parasitic infections

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	8	4

- To understand the process of epidemiologic investigation of parasitic diseases and to be able to apply it in practical settings.
- To provide an advanced overview on the distribution and determinants of different parasitic infections.

1707707 Clinical Parasitology I

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	2	2

- Evaluate magnitude of parasitic infection in the morbidity and mortality of tropical diseases; identify prevalence among community and preventive measures.
- Obtain knowledge about the impact of parasitic infections in tropical diseases, their effect on different body systems, understanding pathogenic mechanisms in diseases and learning how to manage them.

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1707708 Clinical parsitology II

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	-	1

- Provide practical and clinical skills as regards diagnosis and management of parasitic diseases.
- Develop the ability of critical thinking, analysis, interpretation of factual information and clinical data to solve problems related to parasitic diseases.
- Recognize the clinical significance of parasites in humans including the potential interaction between infection with specific parasites and other agents

1707709 Treatment of parasitic infections

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	-	1

- To provide basic knowledge on currently used and novel antiparasitic drugs
- To identify and treat different parasitic infections.
- To understand and recognize clinical pharmacology of different drugs.
- To develop skills on using chemotherapeutic agents for treatment of different parasitic infections.
- Assess chemotherapeutic response
- Mechanism of resistance – new drugs.

1707711 Experimental Parasitology

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	2	2

Studying the liefcycles of snail-borne helminthes.
- Studying the fresh-water snail biology, nutrition and care.
- Studying the fresh-water snails present in the Egyptian environment especially those of medical and veterinary importance.

1707712 Biomedical Research Ethics

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	-	2

- To undertake the needs of biomedical research and its ethical principles.
- To understand the guidelines of universally applicable ethical standards for research involving the human subjects.
- To enable the student to accomplish in broader society as a result of program education.
- Students will understand their ethical responsibility for the field of biomedical research and the human rights of research subjects

1707713 Molecular Parasitology

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	2	2

- Recognize basic concepts for analysis of proteins and gene function in parasitic infections (Western Blot), Southern Blot and Northern Blot).
- Understand tools for molecular biology (Restricting and modeling enzymes).
- Recognize and understand gene cloning.
- Provide basic practical skills for PCR and its application in diagnosis of parasitic infections.
- Understand sequencing techniques.
- Provide practical skills for SDS page: as an experimental approach to identify the interspecific variations of the parasites.

Understand the application of molecular parasitology for serological diagnosis, immunoprophylaxis and drug design for parasitic diseases.

1707801 Advanced Parasitology (I)

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	2	3

- Provide knowledge about geographical distribution, morphological features, biological aspects, different hosts, life cycle and mode of transmission of helminthic parasites.
- Develop intellectual, practical and professional skills in clinical presentations, diagnosis, treatment, prevention and control of different helminthic infections.

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1707802 Advanced Parasitology (II)

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	2	3

- Provide knowledge about geographical distribution, morphological features, biological aspects, different hosts, life cycle and mode of transmission of protozoa.
- Develop intellectual, practical and professional skills in clinical presentations, diagnosis, treatment, prevention and control of different protozoal infections.
- Provide adequate knowledge about arthropods of medical importance and explain their role as causative agents and vectors for diseases.

1707803 Zoonosis

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	-	2

- To define zoonosis that are newly recognized or newly evolved.
- To define zoonosis that occurred previously but show an increase in incidence or expansion in geographical distribution
- To identify and assess prevention and control of emerging or re-emerging parasitic zoonosis which require a good understanding of epidemiology of these infection
- Intended learning of the factors for emergence and re-emergence of zoonosis

1707804 Host parasite relationship

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	-	2

- Impart basic knowledge of parasitology with special emphasis on host parasite relationship.
- Recognize host parasite relationship as an essential tool in the study of parasitic diseases.
- Introduce current trends relating to fundamental concepts in host parasite relationship.
- Analysis of important determinants in disease occurrence.
- Device appropriate strategies for disease management in the context of host parasite relationship.

1707805 Field Studies

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	4	2

- Estimate magnitude of the problem.
- Detect epidemics and define problem.
- Generate hypothesis, stimulate research and design a survey.
- Discuss and detect changes in health practices.
- Explain and facilitate planning.

1707806 Quality control

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	-	1

- Provide knowledge and understanding the history and terminology of quality control.
- Recognize the different tools of quality control.
- Provide basic practical skills for application of quality control in the diagnosis, treatment, prevention and control of different parasitic infections.

1707813 Advanced Molecular Parasitology

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	2	2

- Provide knowledge and understanding the basic molecular biology (structure of proteins, DNA and RNA) and their functions. -Understand the different techniques of protein and nucleic acids extraction. -Recognize basic concepts for analysis of proteins and gene function in parasitic infections (Western Blot), Southern Blot and Northern Blot).
- Understand tools for molecular biology (Restricting and modeling enzymes). -Recognize and understand gene cloning. -Provide basic practical skills for PCR and its application in diagnosis of parasitic infections. -Understand sequencing techniques. -Provide practical skills for SDS page: as an experimental approach to identify the inter-specific variations of the parasites. -Understand the application of molecular parasitology for serological diagnosis, immunoprophylaxis and drug design for parasitic diseases.

1707814 Prevention and control of parasitic diseases

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	-	2

- Select appropriate interventions to interfere with the cycle of infection.
- Assess the implementations of interventions for prevention.
- Prepare an outline plan for a survey for parasitic diseases in a particular location for control.
- Understand reasons for success and failure of these plans.

1707808 Advanced Clinical Parasitology I

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	2	3

- Evaluate magnitude of parasitic infection in the morbidity and mortality of tropical diseases; identify prevalence among community and preventive measures.
- Obtain knowledge about the impact of parasitic infections in tropical diseases, their effect on different body systems, understanding pathogenic mechanisms in diseases and learning how to manage them.

1707809 Advanced Clinical parasitology II

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	-	1

- Recognize the multifaceted nature of parasitology, thereby, moving the study of this science from its initial emphasis on examination of life cycles and morphology of parasites to a wider applied form on clinical basis. -Provide practical and clinical skills as regards diagnosis and management of parasitic diseases.
- Develop the ability of critical thinking, analysis, interpretation of factual information and clinical data to solve problems related to parasitic diseases.

Recognize the clinical significance of parasites in humans including the potential interaction between infection with specific parasites and other agents.

1707810 Treatment of parasitic infections II

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	-	1

- To provide basic knowledge on currently used and novel antiparasitic drugs
- To identify and treat different parasitic infections.
- To understand and recognize clinical pharmacology of different drugs.
- To develop skills on using chemotherapeutic agents for treatment of different parasitic infections.
- Assess chemotherapeutic response
- Mechanism of resistance – new drugs.

1707811 Advanced Experimental Parasitology

Hours/week		
Theoritical	**Practical**	**Total Cr**
2	2	3

- Experimental animals are good tools in investigation of various aspects of parasitology ex.
- Life cycle and transmission of parasitic diseases.
- Study biochemistry, physiology and immunology of parasites inside the experimental host.
- Study interaction or host parasite relationship.

1707812 In-vitro cultivation of parasites

Hours/week		
Theoritical	**Practical**	**Total Cr**
1	2	2

- Cultural methods are good tools in investigation of various aspects of parasitology ex.
- Life cycle and transmission of parasitic diseases.
- Study of biochemistry, physiology and immunology of parasites inside the experimental host.
- Certain aspects of interaction between parasites and individual immune factors.

1707807 Malacology	**Hours/week**		
	Theoritical	**Practical**	**Total Cr**
	2	2	3

- Provide Knowledge and understanding the identification of molluscs associated with parasitic infections.
- Understand snail ecology.
- Provide basic practical skills and experience of snail survey and examination for parasitic infections.
- Recognize and identify different parasites infecting snails
- Develop the ability to perform snail control

1707720 Parasitology.	**Hours/week**		
	Theoritical	**Practical**	**Total Cr**
	1	2	2

- To provide Knowledge covering life cycle and epidemiological aspects of medically important helminthes , protozoans and arthropods
- To understand pathogenesis , clinical features and complications of endemic and national parasitic diseases.
- To introduce the principal for appropriate utilization of the laboratory in coprological and serological diagnosis of parasitic disease
- To recognize treatment strategies , prevention and control measures of parasitic infections

1707722 Molecular Parasitology.	**Hours/week**		
	Theoritical	**Practical**	**Total Cr**
	1	2	2

- Provide knowledge and understanding the basic molecular biology (structure of proteins,DNA)
- Understand the different techniques of protein and nucleic acids extraction.
- Recognize basic concepts for analysis of proteins and gene function in parasitic infections (Western Blot), (Souther Blot).
- Procide basic practical skills for PCR and its application in diagnosis of parasitic infections.
- Provide paractical skills for SDS page: as an experimental approcaches to identify the intraspecific variations of the parasites.
- Understand the application of molecular parasitology for diagnosis, immunoprophylaxis and drug design for parasitic diseases.

1707820 Parasitology	**Hours/week**		
	Theoritical	**Practical**	**Total Cr**
	2	**2**	**3**

To provide Knowledge covering life cycle and epidemiological aspects of medically important helminthes , protozoans and arthropods
To understand pathogenesis , clinical features and complications of endemic and national parasitic diseases.
To introduce the principal for appropriate utilization of the laboratory in coprological and serological diagnosis of parasitic disease
To recognize treatment strategies , prevention and control measures of parasitic infections.

Diploma Degree in Diagnostic Immunology

1708600 - Department of Immunology

Admission Requirements: Graduate students with a diploma or M.Sc. of science or Medical degrees or an equivalent degree.

Core Courses (**22 Cr):** 1708601, 1708602, 1708603, 1708604, 1708605, 1708606, 1708607.

Elective Courses (8Cr): 1701720, 1705720, 1706720, 1712720, 1717720, 1721720, 1708711, 1713720

Core Courses (22 Cr)

Code	Name	Hours / Week		
		Theoretical	**Practical**	**Total Cr**
1708601	Elementary Immunology I	2	-	2
1708602	Elementary Immunology II	3	2	4
1708603	Cellular Immunology I	2	4	4
1708604	Diagnostic Immunology I	2	4	4
1708605	General Clinical Immunology I	3	2	4
1708606	Interactive clinical Immunology	2	-	2
1708607	Hypersensitivity reactions	1	2	2
		15	**14**	**22**
Elective Courses (8 Cr)				
1701720	Biochemistry	1	2	2
1705720	Haematology	1	2	2
1708711	Immuno Hematology I	1	2	2
1706720	Bacteriology	1	2	2
1712720	Medical Biophysics	1	2	2
1717720	Chemical Pathology	1	2	2
1721720	Medical Statistics	1	2	2
1713720	Genetics	1	2	2

Diploma Degree in Allergy

1708600 - Department of Immunology

Admission Requirements: Graduate students with a M.B.Ch.B of Medicine

Core Courses (**26 Cr):**1708601,1708602,1708603,1708604,1708606,1708607,1708609.

Elective Courses (4 Cr): 1715751, 1700655, 1700656, 1721720, 1720721,1708605,1708711.

Core Courses (26 Cr)

Code	Name	Hours / Week		Total Cr
		Theoretical	Practical	
1708601	Elementary Immunology I	2	-	2
1708602	Elementary Immunology II	3	2	4
1708603	Cellular Immunology I	2	4	4
1708604	Diagnostic Immunology I	2	4	4
1708606	Interactive Clinical Immunology	2	-	2
1708607	Hypersensitivity Reactions I	1	2	2
1708608	Allergology I	2	4	4
1708609	Allergology II	3	2	4
		17	**18**	**26**
Elective Courses (4 Cr)				
1715751	Chest Diseases	1	2	2
170٠655	Skin Diseases	1	2	2
170٠656	ENT Diseases	1	2	2
1721720	Medical Statistics	1	2	2
1721721	Computer	1	2	2
1708605	General Clinical Immunology I	2	2	3
1708711	Immuno Haematology I	1	2	2

Master Degree in Immunology and Allergy

1708700 - Department of Immunology

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine, B.Sc.of Veterinary, Pharmacy, or Science.

Core Courses (20 Cr)**:** 1708701,1708702,1708703,1708704, 1708705, 1708706, 1708707, 1708601, 1708605, 1708607.

Elective Courses (10 Cr)**:**

Elective I (6 Cr)**:** 1708708, 1708709, 1708710, 1708711.

Elective II (4 Cr)**:** 1705720,1706720, 1712720, 1717720, 1713720,1721720, 1701720

M.Sc. Thesis: **(**8 Cr)

Core Courses (20 Cr)

Code	Name	Hours / Week		
		Theoretical	Practical	Total Cr
1708601	Elementary Immunology I	2	-	2
1708701	Molecular Immunology	1	2	2
1708702	Immunogenetics	1	-	1
1708703	Diagnostic Immunology II	1	2	2
1708704	Cellular Immunology II	2	2	3
1708705	Apoptosis	1	-	1
1708706	Interactive Immunology	2	-	2
1708707	Journal Club	1	-	1
1708605	General Clinical Immunology I	3	2	4
1708607	Hypersensitivity Reactions I	1	2	2
		15	**10**	**20**
Elective I (6 Cr)				
1708708	Tumor Immunology I	1	2	2
1708709	Specific Auto Immunity I	1	2	2
1708710	Transplantation I	1	2	2
1708711	Immuno Haematology I	1	2	2

Elective II (4Cr)				
1705720	Hematology	1	2	2
1706720	Bacteriology	1	2	2
1717720	Chemical Pathology	1	2	2
1713720	Genetics	1	2	2
1712720	Medical biophysics	1	2	2
1701720	Biochemistry	1	2	2
1721720	Medical Statistics	1	2	2

Doctor of Philosophy in Immunology and Allergy

1708800- Department of Immunology

Admission Requirements: Postgraduate students with a M.Sc. or an equivalent degree in Immunology.

Core Courses (15 Cr): 1708801,1708802,1708803,1708804,1708805,1708806,1708807, 1708808,

Elective Courses (9 Cr):

Elective I (6 Cr): 1708809, 1708810, 1708811, 1708812,1708813

Elective II (3 Cr): 1701820, 1705820, 1706820, 1712820, 1717820, 1713820, 1721820, 1720823

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Ph.D. Thesis: (24 Cr)

Core Courses (15 Cr)

Code	Name	Hours / Week		
		Theoretical	Practical	Total Cr
1708801	Molecular Cell Biology	1	2	2
1708802	Research Topics in Biomedical Science	1	-	1
1708803	Molecular Immunology II	2	2	3
1708804	Immunogenetics	2	-	2
1708805	Cellular & Molecular Immunology	1	2	2
1708806	General Clinical Immunology II	2	2	3
1708807	Interactive Immunology	1	-	1
1708808	Journal Club	1	-	1
		11	**8**	**15**

Elective Courses (9 Cr)

Elective I (6 Cr)

1708809	Hypersensitivity reactions II	1	2	2
1708810	Tumor Immunology II	1	2	2
1708811	Specific Autoimmunity II	1	2	2
1708812	Transplantation II	1	2	2
1708813	Immunohaematology II	1	2	2

Elective II (3 Cr)

1701820	Biochemistry	2	2	3
1705820	Haematology	2	2	3
1706820	Bacteriology	2	2	3
1712820	Medical Biophysics	2	2	3
1720823	Computer	2	2	3
1717820	Chemical Pathology	2	2	3
1713820	Genetics	2	2	3
1721820	Medical Statistics	2	2	3

Description of the Courses Offered by Immunology Department

1708601 Elementary Immunology I

Hours / Week		
Theoretical	Practical	Total Cr
2	--	2

- Historical perspective and overview of immune response
- Antigen and immunogens.
- Molecules that recognize antigens.
- Innate immune mechanisms (phagocytosis, cytokines, toll like receptors, inflammation)
- Arms of the Immune response.
- Mast cell mediators

1708602 Elementary Immunology II

Hours / Week		
Theoretical	Practical	Total Cr
3	2	4

- Cell surface ligand interaction.
- Antigen processing and presentation
- Cellular interactions in generation of immune response.
- Molecules that share in cellular interaction
- Adhesion/accessory molecules in immune synapse formation
- Cellular activation in the immune system: Signal transduction
- Regulation of immune response.
- Immunological laboratories techniques for diagnosis of cell mediated and humoral immune response.

1708603 Cellular Immunology I

Hours / Week		
Theoretical	Practical	Total Cr
2	4	4

- Primary and secondary immune responses
- Non specific effector mechanisms
- Specific effector mechanisms
- T cell and B cell activation

1708604 Diagnostic Immunology I

Hours / Week		
Theoretical	Practical	Total Cr
2	4	4

- Serological diagnosis: detection of antigens and antibodies in different tissue fluids.
- Different immunological methods, ppt in agar, Immuno-diffusion, ELISA, , Electrophoresis, Immuno-electrophoresis, Immuno-histochemistry.
- Molecular detection methods e.g. Western blot, Northern blot

1708605 General Clinical Immunology I

Hours / Week		
Theoretical	Practical	Total CH
3	2	4

- Immunity to infectious agents e.g viral, bacterial and parasitic
- Auto-immune diseases.
- Immunodeficiency
- Case studies

1708606 Interactive clinical Immunology

Hours / Week		
Theoretical	Practical	Total Cr
2	--	2

- Speakers will present relevant clinical cases weekly and hold questions and answers session at the end.
- One student will represent a case weekly in the same material
- Interactive discussion will be opened between students and the speaker ..

1708607 Hypersensitivity Reactions I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

In each reaction, the following are included:
- Definition and components of the reaction.
- Physiology, interactions and effectors mechanisms.
- Pathological effects.
- Clinical examples.
- Therapy.

1708608 Allergology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

- Allergens.
- Types of allergens.
- Factors affecting allergenicity.
- Separation of allergens/allergen standardization.
- Dust mite as allergens.
- Laboratory investigations, essential for allergy diagnosis.
- Quality control and quality assurance

1708609 Allergology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- Overview of allergic reactions.
- Management of allergic diseases.
- Evidence-based literature on immunotherapy:
- Definition History of desensitization.
- Indications for immunotherapy.
- Mechanisms of action of immunotherapy.
- Patient evaluation and selection for immunotherapy.
- Contraindications to immunotherapy.
- Injection and local administration routes of immunotherapy.
- Safety and management of adverse reactions

1708701 Molecular Immunology

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Immunoglobulins; structure, function, biological properties & genetics, TCR: structure, function, properties & genetics.
- Ag recognition: specificity, affinity & avidity, Structure of receptors for antigen on B cells (Ig) and T cells.
- Immunoglobulin isotypes, allotypes, and idiotypes

1708702 Immunogenetics

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- MHC genes: structure, organization and mechanisms.
- Gene generating polymorphism and the genes encoding Ig and T cell receptors

1708703 Diagnostic Immunology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Specificity, affinity, avidity, Principals of methods for detectingsuch reaction e.g., quantitative and qualitative precipitation (immuno-diffusion, immuno- electrophoresis), Rosetting, complement binding methods, affinity chromatography for purification of molecules, radioimmunoassay and enzyme linked immuno sorbant assays (ELISA), Immuno cytochemistry using immunofluorescence or immunoenzyme methods to detect cell surface and intracellular molecules in cell suspensions and sections, Cell separation by fluorescence activated cell sorting, panning, affinity, chromatography, complement mediated cytotoxicity and magnetic beads.

1708704 Cellular Immunology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- B cell activation, T cell activation,
- Antigen presentation, Primary and secondary immune response.
- Immunological memory, Specific effector mechanisms, Non specific effector mechanisms.
- Mucosal immune response

1708705 Apoptosis

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Apoptosis in immune functions, Apoptosis in human diseases.
- Control of Apoptosis, Methods of evaluation of Apoptosis

1708706 Interactive Immunology

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	--	2

- Guest speakers will present relevant material weekly and hold questions and answers session at the end .
- One student will represent a seminar weakly in the same material.

1708707 Journal Club

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Students may choose either Immunology Journal Club or Molecular Cell Biology Journal Club. These clubs meet once per week and discuss scientific articles of interest with the group.
- Students and Faculty participate and lead the group in discussion.

1708708 Tumor Immunology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Summarizes the interactions between the immune system and tumors.
- It discusses causes of tumors and the nature of tumor antigens.
- Reviews the immune mechanisms available to reject tumor cells, and describes how tumors avoid immune elimination.
- Tumour of the immune system.
- Immunetherapy to tumors

1708709 Specific Auto Immunity I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Tolerance and breakdown of tolerance.
- Autoimmunity, Etiology, effector mechanisms of autoimmune diseases.
- Clinical examples e.g. SLE, RA, Thyroiditis, Myathenia Gravis etc,.
- Diagnosis of autoimmune diseases.
- Immunotherapy.

1708710 Transplantation I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Immunopathogenesis of graft rejection, GVHD.
- Animal models in transplantation.
- Tests for acceptance and rejection of grafts.
- Kidney transplantation.
- liver transplant
- Prospectives of tissue transplantation
- Immunotherapy for rejection mechanisms.

-

1708711 Immuno Haematology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Stem cells origin and different types,
- Retrograde generation of stem cells and clinical application.
- Autoimmune hemolytic anemia.
- Drug induced hemolytic anemia.
- Blood banking and its immunological assays.

1708801 Molecular Cell Biology

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- A foundation in molecular cell biology will be provided with an emphasis on model genetic system, transcription, protein synthesis, structural cell biology and cellular signaling

1708802 Research Topics in Biomedical Science

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- This literature based colloquium will introduce students to the current research in the biomedical science with an emphasis on the interdisciplinary research programs. This course will involve student presentations and round table discussion in different topical areas.

1708803 Molecular Immunology

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	3

- Immunoglobulins, structure, function, biological properties & genetics, TCR: structure, function, properties & genetics.
- Ag recognition: specificity, affinity & avidity, Structure of receptors for antigen on B cells (Ig) and T cells.
- Immunoglobulin isotypes,allotypes, and idiotypes, Relationship of structure to function, Structure and poly morphism of class I and class II major histocompitability molecules, Structure of components of complement pathways. Structural characteristics of other cells surface (e.g. CD1, CD2, CD3, CD4, CD5, CD8, LFA1, FcR, C3R, IL2R) and soluble (lymphokines) molecules involved in immune response

1708804 Immunogenetics

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	--	2

- MHC genes: structure, organization and mechanisms generating polymorphism and the genes encoding Ig and T cell receptors.
- Control of antibody isotype switching, Generation of antibody and T-cell receptor diversity, Genetic characteristics and evaluation of the immunoglobulin super family, Genetic and evolution of components of the complement cascade.

1708805 Cellular & Molecular Immunology

Hours / Week		
Theoretical	**Practical**	**Total CH**
1	2	2

- An advanced graduate level course that focuses on the cellular and molecular basis of the immune response. The general format will include lectures and the presentation key paper for class discussion.

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1708806 General Clinical Immunology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	2	٣

- Immunity to virus, bacteria, parasites, fungi, Tolerance and break of tolerance, Spectrum of auto immune diseases.
- Clinical examples (SLE, thyroiditis), Therapy,
- Primary and secondary Immuno deficiency.
- T-cell, B-cell and combined T & B deficiencies, Phagocytic deficiency and others.
- Clinical examples of immunodeficiency cases,diagnosis and treatment.

-

1708807 Interactive Immunology

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Guest speakers will present relevant material weekly and hold questions and answers session at the end .
- One student will represent a seminar weakly in the same material.
- Attendance is required for all students. More than three unexcused absence will result in a fail grade.

1708808 Journal Club

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	--	1

- Students may choose ither Immunology Journal Club or Molecular Cell Biology Journal Club. These clubs meet once per week and discuss scientific articles of interest with the group. Students and Faculty participate and lead the group in discussion .Attendance is required for all students.

1708809 Hypersensitivity Reactions II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	٢

Types of hypersensitivity reactions will include:
- Definition, immunopathogenesis, diagnosis and treatment, Clinical examples: bronchial asthma, atopy, serum sickness, heamolytic disease in newborn etc.
- In each case , the following are included: Immunopathogenesis, Effector mechanism, Diagnosis and Treatment, Immunotherapy.

1708810 Tumor Immunology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Oncogenes and proto-oncogenes, Induction of tumours, Immune response to tumor and effector mechanisms.
- Escape of immune response, Neoplasms of the immune system, Immunotherapy

1708811 Specific Autoimmunity II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	٢

- Mechanisms of endocrine auto immune diseases, Thyroid diseases, Pancreatic diseases, Adrenal diseases.
- Gonadal diseases, Systemic lupus erythematosis, Rheumatiod arthritis, Sero negative arthritidis, Other syndromes

1708812 Transplantation II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- MHC and HLA antigens, Types of rejection and its effector mechanisms, GVHD.
- Clinical types of transplantation (Bone marrow, kidney, skin, liver, and heart), Immunotherapy
-

1708813 Immunohaematology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Heamatopoiesis,
- Heamolytic disease e.g. warm and cold heamolytic anemia.
- Heamolytic disease of newborn.
- Drug induced haemolytic anemia.
- Blood bank.

170٠655 Skin Diseases

Hour/week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Manifestation of type I, II, III, IV hypersensitivity reactions
- Autoimmune skin diseases
- Management and treatment

170٠656 ENT Diseases

Hour/week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Anatomy of the nose,sinuses as well as parasinuses
- ENT examination
- Pathophysiology, pathogenesis and treatment of allergic diseases
- Immunotherapy manegment and treatment

1708620 Immunology

Hour/week		
Theoretical	**Practical**	**Total Cr**
1	-	١

- Deal with the structure of the immune system
- Immune response of the host
- Cellular interaction in generation of immune response
- Effector mechanisms

1708720 Immunology II

Hour/week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Deal with the structure of the immune system
- Cellular interaction in generation of immune response
- immune response of the host to bacterial, parasitic and viral infection
- Types of Hypersensitivity reactions ,pathologic effects.

1708722 Molecular Immunology	**Hours / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- The course will hands on molecular biomedicine principles starting by the idea of : Magic Buller: by Ehrlich that paved the path to the invention o monoclonal antibodies.
- The course will cntail the uses of monoclonal antibodies in diagnostic techniques.
- The course will widen the scope of molecular immunology in the fields of tumor immunotherapy
- The course will touch the field of commercial opportunities that accompanied the monoclonal antibodies establishment.

1708820 Immunology III	**Hour/week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Cellular interaction in generation of immune response
- immune response of the host to bacterial, parasitic and viral infection
- Hazards of immune response include hypersensitivity and autoimmunity.
- Pathologic effects and some clinical example of different types of hypersensitivity and Autoimmunity.
- Immunodeficiency, types, defects, clinical presentation.
- Immunotherapy and its mechanism of action

Master Degree in Histochemistry and Cell Biology

1709700- Department of Histochemistry and Cell Biology

Admission Requirements: Graduate students with a M.B.Ch.B of Medicine, B.Sc. of Veterinary, Pharmacy, B.SC. of Education (Biology Department),

Core Courses:(24 Cr): 1709701, 1709702, 1709703, 1709704, 1709705.1,1709705.2, 1709705.3, 1709705.4, 1709706, 1709707

Elective Courses:(6 Cr): 1701720, 1701721, 1702704, 1710720, 1720721,

M.Sc Thesis: (8 Cr)

Core courses (24 Cr)

Code	Name	Hours / Week		
		Theoretical	Practical	Total Cr
1709701	Micro-Techniques I	2	2	3
1709702	Cell Biology I	2	2	3
1709703	General Histology I	2	2	3
1709704	Functional Histology I	2	2	3
1709705.1	Non-enzyme histochemistry I	1	2	2
1709705.2	Enzyme histochemistry I	1	2	2
1709705.3	Immunohistochemistry I	1	2	2
1709705.4	Ultra histochemistry I	1	2	2
1709706	laboratory animal science	1	2	2
1709707	Cell disorder I	2	-	2
		15	**18**	**24**
Elective Courses (6Cr)				
1701720	Biochemistry	1	2	2
1701721	Molecular Biology	1	2	2
1702704	Cancer Chemistry I	2	-	2
1710720	Pathology	1	2	2
1720721	Computer	1	2	2

Doctor of Philosophy in Histochemistry and Cell Biology

1709800- Department of Histochemistry and Cell Biology

Admission Requirements: Postgraduate student with a M.Sc. or an equivalent degree in Histochemistry or Histochemistry and Cell Biology

Core Courses:(18 Cr): 1709801, 1709802, 1709803, 1709804, 1709805.1, 1709805.2, 1709805.3, 1709807

Elective Courses:(6 Cr):1701820, 1701823, 1702705, 1710820, 1720823
Ph.D Thesis: (24 Cr)
Core courses (18 Cr)

Code	Name	Hours/Week		
		Theoretical	Practical	Total Cr
1709801	Micro-Techniques II	1	2	2
1709802	Cell Biology II	2	2	3
1709803	General Histology II	1	2	2
1709804	Functional Histology II	1	2	2
1709805.1	Non-enzyme histochemistry II	1	2	2
1709805.2	Enzyme histochemistry II	1	2	2
1709805.3	Immunohistochemistry II	2	2	3
1709807	Cell disorder II	2		2
		11	**14**	**18**
Elective Courses (6 Cr)				
1701820	Biochemistry	2	2	3
1701823	Molecular Biology	2	2	3
1702705	Cancer Chemistry II	3	--	3
1710820	Pathology	2	2	3
1720823	Computer	2	2	3

Description of the Courses Offered by Histochemistry and Cell Biology Department

1709701 Micro techniques I

Hours / Week		
Theoretical	**Practical**	**Total C**
2	**2**	**3**

It deals with the principles of important instruments in the field like microtome, cryostat, and microscope. It includes the following items: Principles of tissue processing (fixation, type of fixation, dehydration, embedding in paraffin and other materials, types and methods of different staining), Types of microtome (rocking microtome, rotary microtome, sliding microtome, Freezing microtome and cryostat) and lab Safety.

1709702 Cell Biology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

It deals with the principles knowledge necessary to the field about different cellular organelles such as: Cell types, Cell membrane (structure and function) signal membrane proteins , endomembranous system and protein traffic , (Endoplasmic reticulum, Lysosomes, Golgi apparatus) , Cytoplasmic inclusions (cytoplamic matrix, cytoskeleton), mitochondria structure and function, oxidative enzyme on mitochondrial membrane and mitochondria DNA) , Peroxisomes (struction , function and antioxidative enzumes))

1709703 General Histology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

It concerns with the skills to know and differentiate between different types of tissues and their functions. including : Epithelial tissue (simple epithelial tissue, stratified epithelial tissue, glandular epithelial tissue, neuro epithelial tissue. Muscular tissue(skeletal, cardiac, smooth) and Blood (composition of plasma, erythrocyte. Leucocytes (neutrophiles , basophiles eosinophiles) and platelets).bone marrow and stem cells

1709704 Functional Histology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

Advanced course possesses the different systematic organs, their structure, and functions including: Integumentary system (layers of skin, appendages of the skin and sensory receptor), Endocrine system (thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal body) respiratory system (nasal cavity, nasopharynx, larynx, trachea, bronchial tree), urinary system (kidney , bladder and urinary passages).

1709705.1 Non enzyme Histochemistry I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

It has an introduction to the histochemistry. It includes several items to learn: Histochemistry of proteins(demonstration of proteins with dyes, aldehyde and ketones ,chemical blocking procedures), Histochemistry of carbohydrates (classification and composition of mucosubstances, histochemical methods using different dyes) and Histochemistry of nucleic acids(chemistry and distribution of nucleic acid, demonstration of nucleic acid with dyes mechanisms)

1709705.2 Enzyme Histochemistry I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

It deals with a very important constituents in the cells. It includes: introduction, factors affecting enzyme activities, type of enzyme, technical consideration(preparation of tissue, condition of reaction), hydrolytic enzymes (Phosphatases , Esterases), Oxidoreductases (histochemistry of dehydrogenases, method of succinate enzyme), histochemistry of peroxidases and histochemistry of oxidase (cytochrom oxidase and Xanthine oxidoreductase)

1709705.3 Immuno-histochemistry I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

Basic knowledge of immunohistochemistry will be illustrated as an introductory to the course. The field includes: introduction and definition of immunohistochemistry techniques, Immunohistochemical enzymes techniques(hours raddish proxidase, avidine biotine peroxidase and alkaline phosphatase, chromoigen substrate, application of immunohistrochemistry(light microscopy procedures, immunohistochemical staining in different labeling antibodies) and quality control of immunohistochemistry (principles of quality control, technical aspects of individual steps, immunohistochemical assays and interpretation of stains.

I1709705.4 Ultra-histochemistry **I**

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

The course contains: Preparation of the specimens (fixation, dehydration, embedding), sections of specimen(semi thin sections, ultra thin sections, types of grad mounting) Ultrahistochemical methods of different enzymes(different substrate and buffer used for preparing fresh tissues , Factores affecting the enzyme preservation and osomic tetraoxide used for fixation). staining used for ultrastructure observation and ultrastructural of chemical constitutes (methanamine silver and PAS stains) and Methods for ultracytochemistry.(blood and bone marrow)

1709706 Laboratory Animals Science

Hours / Week		
Theoretical	Practical	Total Cr
1	2	2

The course will present guidelines to care and use of laboratory animal according to international rules including Laboratory animal facilty, care and housing of laboratory animal . Laboratory animal as amodel of human disease. (mice ,rats,), guide of ethics and quality control of mouse strains uses in research Experimental models for use in tumor induction(engineered strain)

1709707 Cell Disorder I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	**-**	**2**

The course deals with causes of cell injury including (hypoxia, ischemia, reactive oxygen species, pathogenic (virus and bacteria), immunity ,age, chemical and physical), types of cell injury, adaptation (programmed cell death and necrosis). It also includes atypical accumulation of substances like(iron, carbon and malory bodies),some disorder of cell organells (Lysosomal disorders, Peroxisomal disorders and nuclear disorders) and cell membrane disorders

1709801 Micro techniques II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

It deals with the principles of important instruments in the field like microtome, cryostat, microscope…etc.. It includes the following items: problems in tissue processing,smear,frozen section, decalcification. Types of microscopes (light microscopes, dark field microscopes, inverted microscopes, phase contrast microscopes, transmission microscopes, scanning microscopes) and lab safety

1709802 Cell biology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

It deals with the principles knowledge necessary to the field about different molecular cell biology. It includes: cell cycle(Phases Regulation, Checkpoints, Role in tumor formation), Cytoskeleton, او Surface membrane signals (interacelluar signal transduction, G-protein –coupled receptor that activate or inhibit adenylyl cyclase and phospholipase C) activation of gene transduction , Centrosomes, Nucleus& Nucleolus, Chromosomes, Cell division

1709803 General Histology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

It concerns with the skills to know and differentiate between different types of tissues and their functions. It includes - Connective tissue proper (Loose connective tissue, Dense connective tissue ,Specialized connective tissue (cartilage, Growth of cartilage, Bone, Bone formation) and lymphoid tissues (mucosa-associated lymphoid tissues, tonsils and thymus).

1709804 Functional Histology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Advanced course possesses the different systematic organs, their structure, and functions including: lymphoid organs. (lymph node, spleen, tonsils and thymus) gastrointestinal system (esophagus, stomach and intestine) and nervous system(nerve tissue, glail cells, central nervous system, brain, cerebral cortex and cerebellum

1709805.1 Non enzyme histochemistry **II**

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

It has an introduction to the histochemistry. It includes several items to learn: Histochemistry of inorganic ions(calcium, iron and zinc) , Histochemistry of lipids(free fatty acid lipid conjugated to protein, glycolipid, different methods for demonstrating lipid content in tissue as oil red and sudan black stains , Histochemistry of biogenic amines.

1709805.2 Enzyme Histochemistry II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

It deals with a very important constituents in the cells. It includes: - Peroxisomal enzymes (Catalase and Proxidase), Digestion method (DNAase digestion and RNAase digestion), Extraction procedures
(DNA extract and RNA extract), Quantitative histochemistry,using microscope associated with digital camer and computer software (image J) for assesement color dinesity, and diferent morphological parameter) Lysosomal enzymes (Acid phosphatase, β- glucuronidase, 5-nucleotidase), Mitochondrial enzymes (ATPase, Succinic Dehydrogenase, Cytochrom Oxidase, Lactic Dehydrogenase).

1709805.3 Immuno-histochemistry **II**

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Basic knowledge of immunohistochemistry will be illustrated as an introductory to the course. The field includes: Immunofluorscence techniques (Introduction,Immunofluorescence Labeling, Immunofluorescence procedures and Application), Application of immuno ultrahistochemistry (Tissue prepatation and fixation, General Immunolabeling) Immunogold procedurs (light and electron microscopy techniques), In situ hybridization techniques (Probe Synthesis and Labeling, Double-Stranded DNA, Probes Oligonucleotide (Oligo) Probes, Hybridization and Signal detection).
Application of in situ hybridization and quatitative immunohistochemistry using image analyzer

1709807 Cell disorder II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	---	2

The course deals with Mitochondrial disorders(Mitochondrial cytopathology, Mitochondrial disease due to DNA deficiency, Mitochondrial myopathesis due to mutation in t-RNA, Role of mitochondria in degeneration disease) folding and misfolding protein , Golgi apparatus disorders (Fucosylation in prokaryotes and eukaryotes, CMP-sialic acid transporter(CST), nucleotides in the Golgi and cystic fibrosis transmembrane conductance regulator (CFTR) and Cell Death (Introduction, Apoptosis and Necrosis)

1709620 Histochemistry and Cell Biology

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	**-**	**1**

It deals with the structure of cell organelles in relation to their functions and the : Cell membrane, Endoplasmic reticulum, Golgi apparatus, Mitochondria, Lysosomes, proxisome Centrosomes, Nucleus, Chromosomes, cytoplasmic inclusion (Cytoskeleton, ribosome, microfilaments).
Principle knowledge of histochemistry methods (detection of different types of proteins, nucleic acids, lipids. and carbohydrates) and different procedures of enzyme activities (acid phosphatase, peroxidase, dehydrogenases enzyme(lactic dehydrogenase).

1709720 Histochemistry and Cell Biology I

Hours / Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

It deals with the principles knowledge necessary to the field about the structure of cell organelles in relation to their functions and the principle knowledge of non-enzymatic and enzymatic histochemistry it includes : Cell types, Cell membrane, Endoplasmic reticulum, -Ribosomes, Peroxisomes, Mitochondria, Golgi apparatus, -Lysosomes,Nucleus, Chromosomes, Cytoskeleton, Centrosomes,Cilia & Flagella. Histochemistry of proteins, nucleic acids, lipids.and carbohydrates.

1709820 Histochemistry and Cell Biology II

Hours / Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

It includes : Cell types, Cell membrane (structure and function) signal membrane proteins, endomembranous system and protein traffic, cytoplamic matrix, cytoskeleton , mitochondria structure and function, oxidative enzyme on mitochondrial membrane and mitochondria DNA), Peroxisomes (struction, function) Histochemistry of proteins, Histochemistry of carbohydrates (classification and composition of mucosubstances, histochemical methods using different dyes) and Histochemistry of nucleic acids (demonstration of nucleic acid with dyes mechanism.Histochemistry of Phospatases, Histochemistry of dehydrogenases, method of succinate enzyme), histochemistry of peroxidases and oxidase (cytochrom oxidase**)**

1709740 Basics inLaboratory animal science	**Hours / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

It includes: Cell types, Cell membrane (structure and function) signal membrane proteins, endomembranous system and protein traffic, cytoplamic matrix, cytoskeleton , mitochondria structure and function, oxidative enzyme on mitochondrial membrane and mitochondria DNA), Peroxisomes (struction, function) Histochemistry of proteins, Histochemistry of carbohydrates (classification and composition of mucosubstances, histochemical methods using different dyes) and Histochemistry of nucleic acids (demonstration of nucleic acid with dyes mechanism.Histochemistry of Phospatases, Histochemistry of dehydrogenases, method of succinate enzyme), histochemistry of peroxidases and oxidase (cytochrom oxidase**)**

1709840 Advanced Laboratory Animal Science	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

It includes: husbandry and animal care (caging, choosing of species and strains and dosing). Origin of predictive animal testing (the "lash lure" case, elixir of sulfanilamide case, thalidomide). Role of animal research in medicine (small animals and nonhuman primates). Production of vaccines and antibiotics, increase the life spans (kidney transplantation, open heart surgey , malignant hypertension , gastric ulcer neurological diseases) animal in genetic engineering and their application in the cure of some human diseases

Master Degree in Histopathology and Cytopathology

1710700 Department of Pathology

Admission Requirements: Graduate student with M.B.Ch.B. of medicine or equivalent degrees.

Core courses: (24 Cr): 1710701,1710702,1710703, 1710704,1710705a,1710705b,1710706a, 1710706**b**

Elective courses (6Cr): 1708720,1721720,1715720,1700758,1714720,1713720,1706720, 1707720

M.Sc. Thesis (8Cr)

Core courses: **(24Cr)**

Code	Name	Hour / Week		
		Theoretical	practical	Total Cr
1710701	General pathology	2	4	4
1710702	Systemic pathology I	2	4	4
1710703	Systemic pathology II	2	4	4
1710704	Systemic pathology III	2	4	4
1710705a	Cyto -pathology Ia	1	2	2
1710705b	Cyto-pathology Ib	1	2	2
1710706a	Cyto-pathology IIa	1	2	2
1710706b	Cyto-pathology IIb	1	2	2
		12	24	24

Elective courses(6 Cr)

1708720	Immunology	1	2	2
1721720	Medical Statistics	1	2	2
1715720	Internal Medicine	1	2	2
1700758	Gynecology	1	2	2
1714720	Surgery	1	2	2
1713720	Human Genetics	1	2	2
1706720	Bacteriology	1	2	2
1707720	Parasitology	1	2	٢

Doctor Degree in Histopathology & Cytopathology

1710800 department of Pathology

Admission Requirments: Graduate student with M.B.Ch.B.of medicine or equivalent degrees., master of pathology.

Core courses: (18 Cr):1710801,1710802,1710803,1710804,1710805a,1710805b, 1710806a, 1710806b

Elective courses (6Cr): 1708820,1721820,1715820,1700758,1714820,1713820,1706820, 1707820

Ph.D Thesis (24Cr)

Core courses(18Cr)

Code	Name	Hour / Week		
		Theoretical	**Practical**	**Total Cr**
1710801	General pathology	1	4	3
1710802	Systemic pathology I	1	2	2
1710803	Systemic pathology II	1	4	3
1710804	Systemic pathology III	1	2	2
1710805a	Cyto-pathology Ia	1	2	2
1710805b	Cyto-pathology Ib	1	2	2
1710806a	Cyto-pathology IIa	1	2	2
1710806b	Cyto-pathology IIb	1	2	2
		8	**20**	**18**
Elective courses(6 Cr)				
1708820	Immunology	2	2	3
1721820	Medical statistics	2	2	3
1715820	Internal Medicine	2	2	3
1700758	Gynecology	2	2	3
1714820	Surgery	2	2	3
1713820	Human Genetics	2	2	3
1706820	Bacteriology	2	2	3
1707820	Parasitology	2	2	3

Description of the Courses Offered by Histopathology and Cytopathology Department

Code	Hour\Week		
1710701 General Pathology	**Theoretical**	**Practical**	**Total C**
	2	4	4

This course includes tissue gross description, proper fixation and cutting, processing , staining,(uses of special staining), basis of immunohistochemistry, basis of electron microscopy in diagnostic pathology, principles of PCR,basis of fine needle aspiration cytology(FNAC). Lectures includes cell structure and function, cell injury, cellular adaptation, cell death. Also, acute and chronic inflammation, neoplasia, genetics of cancer, DNA, RNA structure and function, diseases of immune system, pathology of infectious, environmental and nutritional diseases.

1710702 systemic pathologyI	Hour\Week		
	Theoretical	**Practical**	**Total C**
	2	4	4

This course includes pathology of diseases of infancy and childhood, bleeding disorders, cardiovascularcular system, hemopoietic, and lymphoid organs pathology, candidate should be able to construct a pathological report, understand and choose proper panel of antibodies of immunohistochemistry or other auxiliary techniques to help him reach proper diagnosis. Proper gross description ,case problem solving, and microscopic examination of common and less common pathological lesions of the studied organs and tissues.

1710703 Systemic pathologyII	Hour\Week		
	Theoretical	**Practical**	**Total C**
	2	4	4

This course includes pathology of endocrine system including the endocrine pancreas,renal, urinary and male genital systems and its cytopathological correlations , in this course the candidate should be able to appraise limitations of a biopsy, construct proper differential diagnosis, gain experience to communicate with physicians to fulfill data and reach proper diagnosis. Proper gross description and microscopic examination of common and less common pathological lesions of the studied organs and tissues

1710704 Systemic pathology III	Hour\Week		
	Theoretical	**Practical**	**Total C**
	2	4	4

This course includes the identification of major diagnostic findings of common diseases of bones and CNS and their cytopathological correlations in this course the candidate should be able to appraise limitations of a biopsy, construct proper differential diagnosis, gain experience to communicate with physicians to fulfill data and reach proper diagnosis.

1710705a Cytopathology I a	Hour\Week		
	Theoretical	**Practical**	**Total C**
	1	2	2

This course includes basic concepts of cytopathology, aspects of specimen evaluation, cellular morphology, histochemical stains in cytology, immunohistochemical stains, electron microscopy in cytology, flow cytomertry image cytometry, genetics and molecular techniques. Together with histopathology and cytopathology of diseases of skin, soft tissue and molecular genetics of diseases**.**

1710705 b Cytopathology Ib	Hour\Week		
	Theoretical	**Practical**	**Total C**
	1	2	2

This course includes the identification of major diagnostic findings of sputum cytology, brush cytology,and bronchoalveolar lavage . FNAC of neck masses(including salivary and thyroid glands) and lung lesions and their correlations with histopathologic findings (head & neck, upper and lower respiratory organs)

1710706 a Cytopathology IIa

Hour\Week		
Theoretical	**Practical**	**Total C**
1	2	2

This course includes GIT, hepatobiliary, body fluid cytology, brush cytology of GIT and exocrine pancreas, the candidate should prepare, fix, stain, special stains ,screen and properly diagnose lesions in different cytological smears .Cytological smears and aspirates will be given synchronized with systemic pathology.

1710706 b Cytopathology IIb

Hour\Week		
Theoretical	**Practical**	**Total C**
1	2	2

This course includes the identification of major diagnostic findings of common diseases of,female reproductive systems, PAP smears, exfoliate cytology and ovarian cyst aspirates. Study of breast diseases and fine needle aspiration cytology . At this course candidate should perform and interpret frozen sections

1710801 General Pathology

Hour\Week		
Theoretical	**Practical**	**Total C**
1	4	3

The candidate must assist in the examination, dissection, and processing of tissue samples and participates in gross dissection. **Gross Pathology Techniques**: laboratory experiences emphasize proper handling and evaluation of tissues removed during surgery and examined in the surgical pathology laboratory. terminology are also included This course includes tissue gross description, proper fixation and cutting, processing, staining,(uses of special staining), basis of immunohisto-chemistry,basis of electron microscopy in diagnostic pathology, principles of PCR,basis of fine needle aspiration cytology(FNAC).**General pathology** : Lectures include cell structure and function, injury, adaptation, and death. Study of pathogenesis ,pathology of inflammation, neoplasia, genetics of cancer, autoimmune diseases, nutritional deficiencies, effects of environment on health and disease

1710802 Systemic Pathology I

Hour\Week		
Theoretical	**Practical**	**Total C**
1	2	2

This course includes pathogenesis and pathology of diseases of infancy and childhood, causes,how to reach diagnosis of bleeding disorders, pathogenesis ,gross and microscopic description of changes in cardiovascular system, hemopoietic and lymphoid organ pathology . The candidate should be able to construct a pathological report, understand and choose proper panel of antibodies of immunohistochemistry or other auxiliary techniques to help him reach proper diagnosis. ,case problem solving,The candidate should represent many cases related to their study and how they reached their diagnosis and differential diagnosis.

1710803 Systemic Pathology II

Hour\Week		
Theoretical	**Practical**	**Total C**
1	4	3

Laboratory experiences in systemic pathology provide students with a broad base of knowledge of pathologic processes in various organ systems including endocrine system and endocrine pancreas. Renal course covers several aspects of immunopathology including autoimmune disease, transplantation biology, and use of molecular diagnostics , urinary and male genital systems and cytopathological correlations , in this course the candidate should be able to appraise limitations of a biopsy, construct proper differential diagnosis, Students present critical literature reviews of contemporary research topics, students can present proposals and reports of their research,

1710804 Systemic Pathology III	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

Cellular Structure of the Nervous System and ultrastructure of the C.N.S. in normal and experimental situations, including cell biology of neurons, astrocytes, oligodendroglia, brain macrophages, mast cells, brain vessels, and barriers. Organization of neural systems into global and point-to-point circuits; generative and regressive phenomena; and cerebral transplantation in neurodegenerative conditions This course includes the identification of major diagnostic findings of common diseases of musculoskeletal system and their cytopathological correlations

1710805a Cytopathology I a	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

Together with pathogenesis, gross pathology,histopathology and cytopathology of diseases of skin, soft tissue and molecular genetics of diseases, this course includes, histochemical stains in cytology, immunohistochemical stains, electron microscopy in cytology, flow cytomertry image cytometry, genetics and molecular techniques and how to use these techniques in diagnosis and differential diagnosis of diseases.

1710805b Cytopathology I b	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

This course includes the identification of major diagnostic findings of sputum cytology, brush cytology,and bronchoalveolar lavage . FNAC of neck masses (including salivary and thyroid glands, upper respiratory system and lung) and their correlations with pathologic changes gross and histopatology findings of upper and lower respiratory system organs. In this course the candidate should be able to appraise limitations of a biopsy, construct proper differential diagnosis, students can present proposals and reports of their research

1710806a Cytopathology II a	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

laboratory experiences in systemic pathology provide students with a broad base of knowledge of pathologic processes in various organ systems including gastrointestinal tract, hepatobiliary, exocrine pancreas, body fluid cytology, brush cytology of GIT. The candidate should prepare, fix, stain, special stains ,screen and properly diagnose lesions in different cytological smears .Cytological smears and aspirates will be given synchronized with systemic pathology. in this course the candidate should be able to appraise limitations of a biopsy, construct proper differential diagnosis. Students present critical literature reviews of contemporary research topics.

1710806b Cytopathology II b	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

This course includes the identification of major diagnostic findings of common diseases of,female reproductive systems :ovarian diseases,tubal, uterine, vulval and vaginal diseases ,interpreting endometrial biopsies, PAP smears, exfoliate cytology and ovarian cyst aspirates. Study of breast diseases and fine needle aspiration cytology At this course candidate should perform and interpret frozen sections as well as fine needle aspiration cytology of breast masses palpable and non-palpable which are taken under ultrasound guidance.

1710620 لجميع الأقسام فيما عدا الأشعة	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	-	1

[Introduction to diploma of blood banking] techniques used in pathology lab., tissue processing, cellular injury and adaptation, acute and chronic inflammation, Neoplasia, vascular disorders, diseases of immune system, basis of cytology, infectious nutritional and environmental disorders

1710720 جميع الأقسام فيما عدا الجراحة

Hour\Week		
Theoretical	**Practical**	**Total C**
1	2	2

This course includes: tissue gross description, processing, staining, basis of immunohistochemistry,and cytology and specimen preparation. lectures include cell structure and function, cell injury, repair, and cell death, cellular adaptation, acute and chronic inflammation .DNA and RNA function and structure , basis of molecular Genetics, regulations of gene expression and recombinant DNA technology and PCR. neoplasia, hemodynamic disorders, disorders of immune system, infectious diseases, granulomatous inflammation, Pathology of environmental and nutritional diseases.

1710722 Molecular Pathology

Hour\Week		
Theoretical	**Practical**	**Total C**
3	2	4

- General principles of Pathology, Cellular reactions to injury, inflammatory reactions.
- Thrombosis, Embolism and infarction.
- Metabolic, genetic and nutritional deficiency diseases.
- Pathology of neoplastic disease,
- Molecular characteristics that distinguish normal cells from cancer cells.
- Genetic abnormalities that contribute to cancer development.
- Multi-drug resistance in cancer cells, Immunopathology.
- Contemporary and future strategies for cancer treatment and prevention.
- Laboratory sessions in histopathology and attendance at gross specimen demonstrations are all utilized. Some of the experimental approaches that are used to investigate cancer was also.

1700758 gynecology

Hour\Week		
Theoretical	**Practical**	**Total C**
2	2	3

[Introduction to master in Histopathology & Cytopathology] techniques and indications of pap smear, clinical presentation & management of dysfunctional uterine bleeding, clinical presentations, management and staging of all female genital tract neoplasm.

1710820 جميع الأقسام فيما عدا الجراحة

Hour\Week		
Theoretical	**Practical**	**Total C**
2	2	3

This course includes: tissue gross description, processing, staining, basis of immunohistochemistry, frozen sections, processing, staining and preparation of fine needle aspiration or other cytological specimens.
lectures include cell structure and function, cell injury, repair, and cell death, cellular adaptation, , acute and chronic inflammation .DNA and RNA function and structure, basis of molecular, Genetics, regulations of gene expression and recombinant DNA technology and PCR. neoplasia, hemodynamic disorders, disorders of immune system, infectious diseases,granulomatous inflammation, Pathology of environmental and nutritional diseases.

1710720لقسم الجراحة فقط

Hour\Week		
Theoretical	**Practical**	**Total C**
2	2	3

This course includes introduction to surgical pathology, pathologic bases of GIT including esophagus, stomach and colorectal diseases, liver diseases, and hepatocellular carcinoma, endocrine system including thyroid, parathyroid and pancreas, lymphoid system, breast and soft tissue lesions.

1710820 لقسم الجراحة فقط	Hour\Week		
	Theoretical	Practical	Total C
	2	2	3
This course includes recent advances, immunohistochemistry and molecular pathology of GIT diseases, hepatobiliary system, hepatocellular carcinoma, endocrine system including thyroid, parathyroid and endocrine pancreas, salivary glands, lymph nodes and soft tissue lesions			

1710620 لقسم الأشعة فقط	Hour\Week		
	Theoretical	Practical	Total C
	2	2	3
This course includes histology of normal breast tissue, classification of breast lesions, inflammatory breast lesions, histopathologic criteria of benign and malignant breast lesions, stromal breast lesions, grading and prognostic factors of breast cancer, cytology and core biopsy of breast lesions.			

Master Degree in Radiobiology

1711700- Department of Radiation sciences

Admission Requirements: Graduate students with a M. B. Ch. B of Medicine, B.Sc. of Veterinary, Engineering, science, or Agriculture.

Core courses (18Cr): 1711701, 1711702, 1711703, 1711704, 1711705, 1711706, 1711707, 1711708, 1711709.

Elective courses (12 Cr):

Elective I (4 Cr): 1711710, 1711711, 1711712, 1711713, 1711714.

Elective II (8 Cr): 1701720, 1701721, 1704720, 1721720, 1721721.

M.SC.thesis: (8 Cr)

Core courses (18 Cr)

Code	Name	Hours/Week		
		Theoretical	Practical	Total Cr
1711701	Radiation physics	2	2	3
1711702	Basics of Radiation chemistry	1	2	2
1711703	Mathematics of radioactivity	١	2	2
1711704	Basics of Radiobiology	2	-	2
1711705	Applied radiation sciences	2	-	2
1711706	Waste management	2	-	2
1711707	Radiation protection	١	2	2
1711708	Dose measurements	١	2	2
1711709	Exposures to radiation	1	-	1
		13	**10**	**18**
Elective courses I	**(4 Cr)**			
1711710	Radiopharmaceuticals	2	-	2
1711711	Nuclear medicine	1	-	1
1711712	Crisis management	1	-	1
1711713	Decontamination	2	-	2
1711714	Environmental radiations	2	-	2
Elective courses II	**(8 Cr)**			
1701720	Biochemistry	1	2	2
1701721	Molecular biology	1	2	2
1721720	Medical statistics	1	2	2
1704720	Pharmacology	1	2	2
1720721	Computer	1	2	2

Doctor of Philosophy in Radiobiology

1711800 – Department of Radiation Sciences

Admission Requirements : Postgraduate students with a M.Sc. or an equivalent degree in Radiobiology .

Core Courses (18 Cr) : 1711801, 1711802, 1711803, 1711804, 1711805, 1711806, 1711807, 1711808, 1711809,

Elective I (3 Cr): 1711810, 1711811, 1711812, 1711813, 1711814, 1711815

Elective II (3 Cr): 1701820, 1701821, 1704820, 1721820, 1720823.

Ph.D. Thesis : 24 CH.

Core courses (18 **Cr**)

Code	Name	Hours/Week		Total Cr
		Theoretical	Practical	
1711801	Radiation chemistry	2	2	3
1711802	Radiobiology	2	2	3
1711803	Applications of radiation in Medicine	2	-	2
1711804	Environmental Radiation Sciences	2	-	2
1711805	Radiation and cancer	1	-	1
1711806	Experimental Radiobiology	1	2	2
1711807	Assessment of occupational radiation doses	1	-	1
1711808	Radiation Survey Instrumentation	1	2	2
1711809	Contamination Monitoring Instrumentation	2	-	2
		14	**8**	**18**
Elective courses (3 Cr)				
1711810	Generators and radiation power plants	2	-	2
1711811	Nuclear reactors	2	-	2
1711812	Epidemiology of radiations	1	-	1
1711813	Treatment machines for external beam radiotherapy	2	-	2
1711814	External Photon Beam: Physical aspects.	2	-	2
1711815	Clinical treatment planning in external photon beam radiotherapy	2	-	2
Elective courses II (3 Cr)				
1701820	Biochemistry	2	2	3
1701821	Molecular biology	2	2	3
1721820	Medical statistics	2	2	3
1704820	Pharmacology	2	2	3
1720823	Computer	2	2	3

Course description of the Courses Offered by Radiation Sciences Department

1711701 Radiation physics	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	2	2

The course aims to provide the student with the physical basics underlying the process of radioactivity. Introduce the nuclear structure, radioactive decay kinetics and energetics. Also to illustrate the main types of radioactive decay their sources, and identify the differences between them. Also to encourage sharing of information among colleagues.

1711702 Basics of Radiation chemistry	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

The course provides a broad based training in theoretical and applied nuclear science in order to produce experts with sufficient knowledge in all areas of “classical” and molecular radiation chemistry. The course aims to provide the student with the basics radiation chemistry, physical chemistry of radiation, interaction of particles with matter, decay series and the main sources of radionucleides.

1711703 Mathematics of radioactivity	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

The course provides the student with the detailed Mathematics of radioactive decay; Methods for Determination of Half-Life; calculations concerning the assessment of Radiolabeled Preparations and Dosimetric Calculations involving internal and external dose calculations.

1711704 Basics of Radiobiology	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	-	2

This course mainly aims to introduce the Effects of low and high doses of radiation on the organism and at the molecular and subcellular levels. Also to define Dose response and radiosensitivity Acute and delayed effects in occupational, medical, and environmental exposures are also included.

1711705 Applied radiation sciences	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	-	2

This course aims to highlight the major applications of radioactive isotopes in the various aspects of life. Since their discovery radioisotopes have found a vast majority of applications in the industrial, agricultural, medical, archeological and other fields. Yet, the use of radioactivity has its advantages and disadvantages that must be weight carefully to assess the risk/benefit ratio of its use.

1711706 Waste management	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	-	2

Nuclear power is the only energy-producing technology which takes full responsibility for all its wastes and fully costs this into the product. The course aims to introduce the nature, types and significance of radioactive waste, its sources and the major methods used for their management

1711707 Radiation protection	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

This course is designed to further enhance the skills of the student in a more practical setting. The importance of monitoring and protection is the essential factor in handling radioactive materials. The course focuses on (1) contamination control, (2) airborne sampling, (3) personal protection, (4) radioactive source control, (5) environmental monitoring and (6) access control and work area setup

1711708 Dose measurement	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	2	2

The course is covering all aspects of personal and environmental dosimetry and monitoring for both ionizing and non-ionizing radiations. This includes biological aspects, physical concepts, biophysical dosimetry, external and internal personal dosimetry and monitoring, environmental and workplace monitoring and accident dosimetry and dosimetry related to the protection of patients

1711709 Exposures to radiation	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	-	1

This course aims to introduce the student to the various routs of exposure to radiation. We have to live with many types of harmful radiations either because they cannot be avoided or because they have become essential to our way of life, and knowing the sources of exposure is the first and most vital step on the way to radiation protection

1711710 Radiopharmaceuticals	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

This course aims to introduce the student to the world of radiolabeled chemicals and their uses in pharmacokinetics. It includes the basic techniques used for radiolabeling, assessment of physical and biological properties of the radiolabeled product, quality control and clinical uses of the radiolabeled pahrmacuticals.

1711711 Nuclear medicine	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	**-**	**1**

Nuclear medicine technology is a paramedical field concerned with the safe and effective use of radioactive materials for the diagnosis of various pathological disease states and for the treatment of some specific disorders.

171712 Crisis management	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	**-**	**1**

As with any complex event, conducting an effective response to a radiological emergency requires careful and extensive preparation. The hazards associated with radioactive materials make preparation all the more important. Emergency responders have to deal with the accident in the proper, secure and at all times safe way to ensure self, place and environmental security. It is prudent for all personnel that come in direct contact with radioactive materials, as an emergency responder; to know their role in responding to such an accident should one occur in your community

1711713 Decontamination	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

This course aims to prepare the students for situations where contamination with radioactivity should occur. It introduces them to the principle of contamination, its types whether internal or external and how to deal with each of these types for personnel and workplace. It also gives them a general idea about the impact of contamination on the environment.

1711714 Environmental radiations	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

This course focuses on the environmental and social impact of radioactivity and radionuclide usage. It deals with issues including; sources and routes of radioactivity in the environment, environmental surveillance and radiological impact assessment. It also discusses what we know about how to remediate the nuclear weapons, plants and laboratories and their environs contaminated with radioactive materials.

1711801 Radiation chemistry	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**2**	**3**

This course gives a complete and concise description of the latest knowledge on nuclear and radiochemistry as well as their applications in the various fields of science. It is aimed at providing sound knowledge about the properties of matter, study of radioactive matter in nature, investigation of radioactive transmutations, chemistry of radioelements etc. All the subjects are presented clearly and comprehensibly, and in a logical sequence, avoiding detailed derivations of equations

1711802 Radiobiology	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**2**	**3**

The course reviews the concepts relating to the effects of radiation on normal tissues and effects on malignant cells. The course also includes significant detail regarding cell cycle effects, cell signal induction, and molecular aspects related to radiotherapy and its effects on tissue.

1711803 Applications of Radiation in Medicine	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

The modern practice of nuclear medicine is now well into its seventh decade. With the incredible development of PET/CT, its strength in depicting physiology and function became evident. This course aims at highlighting modern Clinical Nuclear Medicine which focuses on the universal state of the art in both diagnostic and therapeutic radionuclide methodology. Pertinent clinical applications are emphasized

1711804 Environmental Radiation Sciences	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

This course focuses on the impact of radioactivity and radionuclide usage on the environment. It deals with issues including; biological impact of radiation, radiotoxicity and annual doses, sources and routes of radioactivity in the environment, areas and sources of radiation exposure and some of the major tests and accidents involving radiation.

1711805 Radiation and Cancer	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	**-**	**1**

This course is mainly involved with radiation-induced cancers. Carcinogenesis from ionizing radiation does occur at the lowest conceivable doses and dose-rates as documented by the emerging information from molecular radiation biology on the recently recognized new processes such as genomic instability, bystander effects, hypersensitivity, and the adaptive response. The course discusses the effect of ionizing and non-ionizing radiation on DNA and their role in cancer induction

1711806 Experimental Radiobiology

Hour\Week		
Theoretical	**Practical**	**Total C**
1	**2**	**2**

This course aims to provide the students with the basic understanding of cellular and sub-cellular events associated with radiation, tumor and non-tumor cellular events and kinetics. That should eventually develop into an understanding of all common experimental radiotherapy modalities and other cytotoxic agents; understanding of the results and implications of these studies is also required.

1711807 Assessment of Occupational Radiation Doses

Hour\Week		
Theoretical	**Practical**	**Total C**
1	**-**	**1**

Occupational exposure to ionizing radiation can occur in a range of industries, such as mining and milling; medical institutions; educational and research establishments and nuclear fuel facilities. Adequate radiation protection of workers is essential for the safe and acceptable use of radiation, radioactive materials and nuclear energy. This course satisfies the need of occupationally exposed workers to have a basic awareness and understanding of the risks posed by exposure to radiation and the measures for managing these risks.

1711808 Radiation Survey Instrumentation

Hour\Week		
Theoretical	**Practical**	**Total C**
1	**2**	**2**

It is true that radiation can induce harm but its benefits certainly outweigh its potential hazards. This realization has led to rapid advancements in theory and applications of radiation measurements. This course deals with instruments and devices used for the detection and measurement of radiation. It aims to introduce the student to the working principles of different types of radiation detectors. It also encompasses all aspects of design, development, and effective use of the detection devices.

1711809 Contamination Monitoring Instrumentation

Hour\Week		
Theoretical	**Practical**	**Total C**
2	**-**	**2**

This course aims mainly to introduce the student to the instruments used to discover and control radioactive contamination and how they are used. The hazards to people and the environment from radioactive contamination depend on the nature of the radioactive contaminant, the level of contamination, and the extent of the spread of contamination. The efficient use of these instruments can ensure fast detection of contamination before deleterious effects could happen, help efficient control over the contamination and ensure effective removal of contaminant.

1711810 Generators and radiation power plants

Hour\Week		
Theoretical	**Practical**	**Total C**
2	**-**	**2**

This course aims to introduce the student to the vast and expanding world of generators and radiation power plants. The course will discuss the various aspects of generators work including: their design, fuels, uses, life span, efficiency, safety and models.

1711811 Nuclear reactors

Hour\Week		
Theoretical	**Practical**	**Total C**
2	**-**	**2**

This course gives a comprehensive description of the structure of the nuclear reactors, their components, classification and methods of their application in nuclear power plants for electric power generation and also the control of nuclear reactors. It also focuses on the design and analysis of innovative nuclear reactor systems aimed at improved efficiency, a high degree of safety, flexibility and user-friendliness, combined with a reduction in radioactive waste

1711812 Epidemiology of Radiations	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	1	**-**	**1**

This course will present an overview of the field of radiation epidemiology, with a focus on radiation-related cancer. It will begin with epidemiologic studies of radiation-exposed populations, medically irradiated populations, and persons with occupational or environmental radiation exposures. Methods for quantifying radiation risks, the use of such information in setting radiation protection standards, and risk communication also will be discussed. Most of the course will focus on ionizing radiation, but non-ionizing radiation will be considered as well.

1711813 Treatment machines for external beam radiotherapy	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

This course aims to introduce the student to the various types and sources of radiations used in radiotherapy. These radiations include X rays, γ- rays, protons, neutrons and heavy ions, but the course will give special attention to the first two of these types because they are the most commonly used. Te course will also consider shielding during radiotherapy, simulation and training.

1711814 External Photon Beam: Physical aspects	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

his course aims to introduce the student to external photon beam radiotherapy which is the largest of the two main procedures of radiotherapy. In external beam radiotherapy the radiation source is at a certain distance from the patient and the target within the patient is irradiated with an external radiation beam. The course covers all aspects of photon beam radiotherapy including its characteristic physical parameters, categories, origins, sources, quantification and usage.

1711815 linical treatment planning in external photon beam radiotherapy	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**-**	**2**

This course aims to introduce the student to the basic principles and practices involved in planning radiotherapy treatment with external photon beam. New technologies have greatly changed radiation therapy. As a result, clinical practice in the new millennium is a mixture of standard radiation therapy and special procedures based on current developments in imaging technology, treatment planning, and treatment delivery. Both conventional and modern techniques in radiation therapy will be attended to.

Diploma in Medical Biophysics

1712600 - Department of Medical Biophysics

Admission Requirements: Graduate students with a degree of Science, Education, Engineering, Applied Medical Sciences, Medicine, Dentistry, Pharmacy, Nursing, Veterinary Medicine, Physiotherapy, or any degree relevant to Medical Biophysics and recognized by the Council of the Medical Biophysics Department.

Core Courses (24 **Cr**)**:** 1712601, 1712602, 1712603, 1712604, 1712605, 1712606, 1712607, 1712608.

Elective Courses (6 **Cr**)**:** 1712609, 1712610, 1712611, 1709620,1721620

Core Courses (24 Cr)

Code	Name	Hours/Week		Total Cr
		Theoretical	Practical	
1712601	Medical Imaging Biophysics	2	2	3
1712602	Principals of Magnetic Resonance Imaging	2	2	3
1712603	Principals of 3-D Reconstructions in Medical Imaging	2	2	3
1712604	Fundamentals of Radiological Biophysics and Dosimetry - I	2	2	3
1712605	Introduction to Biomedical Engineering – I	2	2	3
1712606	Principals of Ultrasound and Laser Biophysics	2	2	3
1712607	Introduction to Vascular Imaging Techniques	2	2	3
1712608	Basics of Electron Microscopy	2	2	3
		16	**16**	**24**
Elective Courses (6 Cr)				
1712609	Fundamentals of Radiological Biophysics and Dosimetry - II	1	2	2
1712610	Introduction to Biomedical Engineering – II	1	2	2
1712611	Basics of Therapeutic Medical Devices	1	2	2
1709620	Histochemistry and Cell Biology	1	-	1
1721620	Medical Statistics	1	-	1

Master Degree in Medical Biophysics

1712700 - Department of Medical Biophysics

Admission Requirements: Graduate students with a degree of Science, Education, Engineering, Applied Medical Sciences, Medicine, Dentistry, Pharmacy, Nursing, Veterinary Medicine, Physiotherapy, or any degree relevant to Medical Biophysics and recognized by the Council of the Medical Biophysics Department.

Core Courses (24 **Cr**)**:** 1712701, 1712702, 1712703, 1712704, 1712705, 1712706, 1712707, 1712708.

Elective Courses (6 **Cr**)**:** 1712709, 1712710, 1712711, 1712712, 1712713, 1712714, 1712715, 1712716, 1712717, 1701720, 1703720, 1704720, 1706720, 1707720, 1709720, 1721720.

M.Sc. Thesis: 8 Cr.

Core Courses (24 Cr)

Code	Name	Hour/ Week		Total Cr
		Theoretical	Practical	
1712701	Biophysics of Proteins and Nucleic Acids – I	2	2	3
1712702	Fundamentals of Tissue Engineering – I	2	2	3
1712703	Introduction to Mathematical Modeling in Medical Biophysics – I	2	2	3
1712704	Advances in Radiological Biophysics and Dosimetry – I	2	2	3
1712705	Advances in Biomedical Engineering – I	2	2	3
1712706	Biotransport – I	2	2	3
1712707	Bioelectricity	2	2	3
1712708	Biomechanics	2	2	3
		16	**16**	**24**

Elective Courses (6 Credit Hours)

1712709	Advanced Topics in Magnetic Resonance Imaging	2	2	3
1712710	3-D Reconstruction Techniques in Medical Imaging	2	2	3
1712711	Advanced Topics in Ultrasound and Laser Biophysics	2	2	3
1712712	Advances in Vascular Imaging Techniques	2	2	3
1712713	Advanced Topics in Electron Microscopy	2	2	3
1712714	Advances in Therapeutic Medical Devices	2	2	3
1712715	Mathematical Methods I	2	2	3
1712716	Analysis of Chemical Signaling	2	2	3
1712717	Journal Club in Medical Biophysics I	2	2	3
1701720	Biochemistry	1	2	2
1703720	Physiology	1	2	2
1704720	Pharmacology	1	2	2
1706720	Bacteriology	1	2	2
1707720	Parasitology	1	2	2
1709720	Histochemistry and Cell Biology I	1	2	2
1721720	Medical statistics	1	2	2

Prerequisite Courses Required for the Registration to the Doctor of Philosophy in Medical Biophysics

1712800 Department of Medical Biophysics

Admission Requirements: Postgraduate students with an M.Sc. or an equivalent degree relevant to Medical Biophysics, are required to take supplementary apposite prerequisite courses (18 Cr.) and pass a qualifying exam before being admitted to the requirements of registration to the Degree of Doctor of Philosophy in Medical Biophysics.

Core Courses (18 **Cr**)**:** 1712821, 1712822, 1712823, 1712824, 1712825, 1712826.

Code	Name	Hour/ Week		Total Cr
		Theoretical	Practical	
1712821	Biophysics of Proteins and Nucleic Acids – II	2	2	3
1712822	Fundamentals of Tissue Engineering – II	2	2	3
1712823	Introduction to Mathematical Modeling in Medical Biophysics – II	2	2	3
1712824	Advances in Radiological Biophysics and Dosimetry – II	2	2	3
1712825	Advances in Biomedical Engineering – II	2	2	3
1712826	Biotransport – II	2	2	3
		12	**12**	**18**

Doctor of Philosophy in Medical Biophysics

1712800 - Department of Medical Biophysics

Admission Requirements: Postgraduate students with an M.Sc. or an equivalent degree in Medical Biophysics, after passing apposite pre-requisite courses.

Core Courses (18 **Cr**)**:** 1712801, 1712802, 1712803, 1712804, 1712805, 1712806.

Elective Courses (6 **Cr**)**:** 1712807,1712808, 1712809, 1712810, 1712811, 1712812, 1712813, 1712814, 1712815, 1712816, 1712817, 1701820, 1703820, 1704820, 1706820, 1707820, 1709820, 1718820, 1719820, 1721820.

Ph.D. Thesis: (24 **Cr**)

Core Courses (18 Cr)

Code	Name	Hour/ Week		
		Theoretical	Practical	Total Cr
1712801	Biophysics of Membranes and Membrane Proteins	2	2	3
1712802	Advanced Topics in Tissue Engineering	2	2	3
1712803	Modeling Physiological Systems	2	2	3
1712804	Radiobiology and Radionuclides	2	2	3
1712805	Medical Instrumentation	2	2	3
1712806	Mechanics of Human Movement	2	2	3
		12	**12**	**18**

Elective Courses (6 Credit Hours)

1712807	Biosolid and Biofluid Mechanics	2	2	3
1712808	Introduction to Theoretical Molecular Biophysics	2	2	3
1712809	Methods in Molecular and Cellular Biophysics	2	2	3
1712810	Mathematical Methods II	2	2	3
1712811	Advanced Signal Processing	2	2	3
1712812	Proteome Informatics	2	2	3
1712813	Introduction to Modern Biomaterials	2	2	3
1712814	Biological Micro- and Nanotechnology	2	2	3
1712815	Biocopatibility	2	2	3
1712816	Fundamental Neuroscience	2	2	3
1712817	Journal Club in Medical Biophysics II	2	2	3
1701820	Biochemistry	2	2	3
1703820	Physiology	2	2	3
1704820	Pharmacology	2	2	3
1706820	Bacteriology	2	2	3
1707820	Parasitology	2	2	3
1709820	Histochemistry and Cell Biology II	2	2	3
1718820	Radiodiagnosis	2	2	3
1719820	Nuclear Medicine	2	2	3
1721820	Medical Statistics	2	2	3

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Description of the Courses Offered by Medical Biophysics Department

1712601 Medical Imaging Biophysics	**Hour\Week**		
	Theoretical	**Practical**	**Total C**
	2	**2**	**3**

This course is an introduction to the different medical imaging modalities, including: X-rays, Digital Subtraction Angiography, Dual-energy X-ray Absorptiometry, Electron Microscopy, Nuclear Medicine, Clinical Ultrasound, Computed Tomography, Magnetic Resonance Imaging, and Gamma Camera. The physical and mathematical principles involved in the formation of medical images will be presented, along with discussions of the limitations to resolution and image noise. Examples of primary clinical applications for each modality will be given.

1712602 Principals of Magnetic Resonance Imaging	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This is a basic course introduces the physical and mathematical principals of magnetic resonance imaging. Topics include: Atoms and protons, Longitudinal relaxation forces, Angular momentum and precession, Nuclear Magnetic Resonance, Radio waves and magnetic fields, Transverse relaxation, Spatial localization, Body Tissues, Field Strength, Repetition time and contrast, Flip angle, MRI Spectroscopy, Frequency encoding, Phase encoding, K-space trajectories, Echo-planer imaging, Basic pulse sequence annotation Single slice acquisitions, 2-D multislice acquisitions, 3-D multislice acquisitions.

1712603 Principals of 3-D Reconstructions in Medical	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

Physics and mathematics of three-dimensional reconstruction techniques in medical imaging: Projection slice theorem, Back-projection techniques, Analytical and iterative reconstruction algorithms, and Numerical methods; applications in X-Ray Computed Tomography and Nuclear Magnetic Resonance.

1712604 Fundamentals of Radiological Biophysics and Dosimetry	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course deals with theory and measurement of radiation as applied to medicine and the laboratory. It covers ionizing sources as used in biology, diagnostic radiology, nuclear medicine, and radiation therapy. Topics include: ICRU definitions of radiation quantities, Radioactivity, Attenuation and scattering of photons and electrons, Interactions with tissue, Radiation equilibrium, and Practical radiation dosimeters, including: ion chambers, diodes, TLD, film, and chemical dosimeters.

1712605 Introduction to Biomedical Engineering – I	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course is designed as an introduction to some of the electrical and computer engineering contributions to biomedical engineering, with particular emphasis given to related on-going departmental research. Course topics include: Background of general human anatomy and physiology, Background of electrophysiology, Modeling, recording and automated analysis of the electroencephalogram (EEG) and bedside clinical applications.

1712606 Principals of Ultrasound and Laser Biophysics	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

Acoustic-wave propagation in biological materials, Examples of practical medical instrumentation resulting from ultrasound interactions with biological structures, and Ultrasound laboratory equipments.

Basics of different types of lasers and their medical use, Differences in their use, Important energy and delivery system concepts for applying these lasers to tissues, Clinical safety precautions, outlined in the ANSI standards for safe use of lasers in health care facilities, are discussed along with recommended medical credentialing guidelines.

1712607 Introduction to Vascular Imaging Techniques	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**
The course is a basic introduction to the different imaging modalities used to image blood vessels, particularly for: Cardiovascular, Cerebrovascular, and Peripheral vessel disease.			

1712608 Basics of Electron Microscopy	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**
The course is designed to teach the student the basics of the principles and techniques of electron microscopy. The course is an interactive didactic course. This course covers the following topics: Structure and function of the electron microscope, Tissue preparation for both types of scopes, Freeze fracture, Immunocytochemistry at the EM level, Image analysis, and Photographic techniques and some special applications to include wavelength spectroscopy			

1712609 Fundamentals of Radiological Biophysics and Dosimetry-II	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
This course extends basic understanding of theory and measurement of radiation as applied to medicine and the laboratory. Topics include: Production of radioisotopes and radiopharmaceuticals, Convolution and Monte Carlo dose computations, Instrumentation for emission imaging, Gamma Camera, Single Photon Emission Computerized Tomography, Positron Emission Tomography, Radioactive waste issues, radon gas, emergencies, and wide variety of radiation sources from health physics perspective, and Radiation risks and radiation protection guidelines, including international current regulations.			

1712610 Introduction to Biomedical Engineering – II	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
This course extends basic understanding of the electrical and computer engineering contributions to biomedical engineering. Course topics include: Modeling, recording and automated analysis of the electroencephalogram (EEG). Clinical applications, modeling, recording and automated analysis of the electromyogram (EMG). Clinical applications, modeling, recording and automated analysis of the electrocardiogram (EKG). Clinical applications, modeling of neural networks. Clinical applications and Medical imaging techniques (computerized tomography, magnetic resonance imaging and ultrasonic imaging).			

1712611 Basics of Therapeutic Medical Devices	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
This course will provide to students understanding of therapeutic medical devices so that they will be able to contribute in hospitals, industry, and research. Pacemakers and defibrillators, Communication aids, Neural assist devices, Physiotherapy equipments, Cardiac valves, angioplasty, Arterial stents, Anesthesia machine and ventilator, Intelligent drug delivery, Artificial kidney, Gastrointestinal therapy, Photodynamic therapy, Radiotherapy linear accelerator.			

1712701 Biophysics of Proteins and Nucleic Acids – I	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**
This is a course for advanced level study of biomolecular structure and function from a theoretical perspective. The focus is on studies of proteins and nucleic acids illustrating current methods of research on these topics: Brief review of the fundamental concepts in molecular and macromolecular structure, Survey of definitions and computational methods for the calculation of intermolecular forces, molecular dynamics and protein folding, Biophysics and energetics of enzmatic reactions as an illustration of fundamental concepts and methods in the study of biological mechanisms, and Structures and properties of DNA and some protein/DNA complexes presented in the same general context of biophysical concepts and molecular computations			

1712702 Fundamentals of Tissue Engineering – I	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

Course topics include: Cellular attachment, Extracellular matrix biochemistry and tissue organization, Cell culture, Synthetic polymetric membranes, Methods of cell encapsulation, Biohybrid artificial organs, and Artificial cells, skin, bone, cartilage, liver.

1712703 Introduction of Tissue Engineering-1	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

The introductory transdisciplinary course is designed to introduce students to important problems in a wide variety of fields of biology and medicine in which mathematical methods can be employed effectively. In many of these problems the more traditional methods of laboratory experiment, clinical trials, and field observation may be difficult, if not virtually impossible, to use. Topics range from: Population biology, Systems physiology, Clinical problems in medicine, and Cell and molecular biology. The emphasis is on qualitative rather than numerical studies, and on analytic methods rather than computer simulation. Open problems are indicated.

1712704 Advances in Radiological Biophysics and Dosimetry – I	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course deals with theory and measurement of radiation as applied to medicine and the laboratory. It covers ionizing sources as used in biology, diagnostic radiology, nuclear medicine, and radiation therapy. Topics include: ICRU definitions of radiation quantities, Regulations and enforcement, Radioactivity, Attenuation and scattering of photons and electrons, Interactions with tissue, Radiation equilibrium, External and internal dose estimation, Production of radioisotopes and radiopharmaceuticals, Convolution and Monte Carlo dose computations, Practical radiation dosimeters (ion chambers, diodes, TLD, film, chemical), Instrumentation for emission imaging, Gamma Camera, Single Photon Emission Computerized Tomography, Positron Emission Tomography, Radioactive waste issues, radon gas, emergencies, and wide variety of radiation sources from health physics perspective, and Radiation risks and radiation protection guidelines, including international current regulations.

1712705 Advances in Biomedical Engineering – I	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course is designed as an introduction to some of the electrical and computer engineering contributions to biomedical engineering, with particular emphasis given to related on-going departmental research. Course topics are: Background of general human anatomy and physiology, Background of electrophysiology, Modeling, recording and automated analysis of the electroencephalogram (EEG). Clinical applications, Modeling, recording and automated analysis of the electromyogram (EMG). Clinical applications, Modeling, recording and automated analysis of the electrocardiogram (EKG). Clinical applications, Modeling of neural networks. Clinical applications and medical imaging techniques (computerized tomography, magnetic resonance imaging and ultrasonic imaging).

1712706 Biotransport – I	**Hour\Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course deals with fundamentals of mass and heat transport as they relate to living systems. The course topics include: Convection, Diffusion, Active transport, Osmosis, Conservation of momentum, Mass and energy as applied to cellular and organ level transport and Examples from circulatory, respiratory, renal and ocular physiology will be examined

1712707 Bioelectricity

Hour\Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

This is an introductory course in electrophysiology followed by a quantitative approach based on the general principles established in physics and biophysics. The core course covers the following topics: Electrical biophysics of nerve and muscle, Electrical conduction in excitable tissue, Quantitative models for nerve and muscle including the Hodgkin-Huxley equations, Biopotential mapping, Cardiac electrophysiology, and Functional electrical stimulation

1712708 Biomechanics

Hour\Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

Course topics include the following: Fundamental principles of mechanics applied to the study of biological systems, Passive mechanical behaviors of biological materials, Measurement of nonlinear strain in tissues, Arterial flow, Mechanical interactions of implants with tissue, Skeletal muscle mechanics, Segmental biomechanics, Control of motion, and Laboratory experience in material covered in lecture.

1712709 Advanced Topics in Magnetic Resonance Imaging

Hour\Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

In this advanced course, in-depth examination of the physical and mathematical grounds of magnetic resonance imaging and its clinical applications are given. Topics include: Proton environments and T1 relaxation, Transverse magnetization and T2 contrast, Chemical shift, Magnetic field gradient, k-Space, Pulse sequences, Signal-to-noise and spatial resolution, Receiver coils, Magnetic field strength, Gradient echo and spin echo, multiecho techniques, Strategies for fast imaging, Clinical MRI techniques.

1712710 3-D Reconstruction Techniques in Medical Imaging

Hour\Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

Physics and mathematics of three-dimensional reconstruction techniques in medical imaging: Projection slice theorem, Back-projection techniques, Analytical and iterative reconstruction algorithms, and Numerical methods; applications in X-Ray Computed Tomography, Single Photon Emission Computed Tomography, Positron Emission Tomography, and Nuclear Magnetic Resonance.

1712711 Advanced Topics in Ultrasound and Laser Biophysics

Hour\Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

Acoustic-wave propagation in biological materials, Practical examples of medical instrumentation resulting from ultrasound interactions with biological structures, and Ultrasound equipments in the clinical setting.Basics of different types of lasers and their medical use, Differences in their use, Important energy and delivery system concepts for applying these lasers to tissues, Clinical safety precautions, outlined in the ANSI standards for safe use of lasers in health care facilities, are discussed along with recommended medical credentialing guidelines, and Video examples of different surgical procedures showing various laser effects are integrated into the presentation to clarify the underlying physical principles and relate them to clinical applications.

1712712 Advances in Vascular Imaging Techniques

Hour\Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

This is an advanced course presenting both the theoretical grounds and theory of function of cutting-edge technologies used to image blood vessels, particularly for: Cardiovascular, Cerebrovascular, and Peripheral vessel disease.

1712713 Advanced Topics in Electron Microscop

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

The course is designed to teach the student the full scope of the principles and techniques of electron microscopy. The course is an interactive didactic course. Practical application and hands on can be arranged as a follow-up course. This course covers the following topics: Structure and function of the electron microscopes (TEM, SEM, and STEM), Tissue preparation for both types of scopes, Freeze fracture, Immunocytochemistry at the EM level, Image analysis, and Photographic techniques and some special applications to include energy dispersive spectroscopy (EDS), wavelength spectroscopy and a variety of others.

1712714 Advances in Therapeutic Medical Devices

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

This course will provide to students understanding of therapeutic medical devices so that they will be able to contribute in hospitals, industry, and research. Pacemakers and defibrillators, Communication aids, Aids for the blind, Neural assist devices, Prosthetic joints, Physical therapy equipment, Cardiac valves, angioplasty, Arterial stents, Anesthesia machine and ventilator, Intelligent drug delivery, Artificial kidney and pancreas, Gastrointestinal therapy, Photodynamic therapy, Computerized Tomography, Magnetic Resonance Imaging, Radiotherapy linear accelerator, Gamma Camera, Positron Emission Tomography.

1712715 Mathematical Methods I

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

This course presents a range of mathematical and computational methods and concepts needed in the analysis of a wide range of medical and biological phenomena. Here the emphasis is on understanding the mathematical methods, not specifically on their applications to scientific problems. There are no prerequisites for this course. Topics treated vary according to the interests and prior mathematical experience of the participants, which, minimally, should include: Linear algebra, Advanced calculus, and Differential equations.

1712716 Analysis of Chemical Signaling

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

This course topics will concern quantitative analysis of chemical signaling systems, including: Receptor/Ligand binding and trafficking, Signal transduction and second messenger production, and Cellular responses such as adhesion and migration.

1712717 Journal Club in Medical Biophysics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	**2**	**3**

Students will be instructed on the standard methods of writing scientific research papers and thesis. Moreover, every student will present a recent journal article in the area of biophysics, physiology, biomedical engineering, or structural biology. The article will be approved by the course director. There will be one presentation per term. The student will discuss in detail the article, the methodologies used and whether these were appropriate for the experiments carried out. The presentation should be 45 minutes with 15 minutes for questions and discussion, with the course director's permission, students will be able to present their own data instead of a journal article

1712720 Medical Biophysics I	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**

The purpose of this course is to familiarize students with basics of medical biophysics for biomedical research. This course presents a practical approach to medical biophysics techniques. The course will cover fundamentals of medical biophysics. Topics covered will include: Beer's-Lambert law, importance of determination of trace elements in human pathologies, concepts of action potential, nanotechnology and applications in medicine, and basics of mathematical modeling in medicine

1712721 Molecular Physics	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

The course will cover the topics: Introduction to cell biology and physical scales, Langevin equation, diffusion equation, low Reynolds numbers, Thermodynamics of microscopic systems, entropic forces, Experimental approaches for freely jointed chain, Ionic transport, Debye-Huckel theory, Self-assembly: thermodyamics of solutions, micelle formation, Protein folding, cooperativity, helix-coil transition, Activation, enzymes & catalysis, thermal ratchets, Enzymes as motors, Michaelis-Menten rule, Nernst equation, Donnan equilibrium, Molecular pumps, respiration, Nerve cells.

1712722 Computational Biology	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**

A course in computational biology is presented to students who are interested in the structural biology, mathematics and computational methods. The course includes: An introduction to mathematical methods useful in theoretical molecular biophysics, Computational approaches to calculate properties of molecules of biological interest, as well as Molecular mechanical representation of systems and ensembles.

1712801 Biophysics of Membranes and Membrane Proteins	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

The course covers the fundamental physico-chemical principles governing the assembly, structure, dynamics and function of artificial and biological membranes as well as the principles and applications of selected biophysical techniques and computational methods. Among the topics examined in the course are: The energetics and thermodynamics of lipid aggregation, Phase transitions, Bilayer structure and dynamics and spectroscopic methods (fluorescence, NMR, Raman), Theoretical analysis of lipid dynamics and phase transitions, Electrostatics of charged bilayers, and Membrane proteins, structure, and function

1712802 Advanced Topics in Tissue Engineering	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course provides students with an opportunity for in-depth study in a specialized area of tissue engineering. Topics include: New biomaterials designed for tissue engineering, Biological signals and signaling mechanisms, Delivery and phenotypic expression of transplanted cells, Normal and directed healing mechanisms, Ontogenic development of tissues and glands, and Stem cells and growth factor delivery and applications.

1712803 Modeling Physiological Systems	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

Models of nonlinear biological and physiological systems are derived from first principles of thermodynamics, mechanics, and chemistry. The models typically take the form of nonlinear partial differential equations. Among the methods applied to study the behavior equations and to gain insight into the function of physiological systems are: Fundamental principles, Analysis and synthesis of dynamic models, Pressure-flow Model, Cardiac and circulation dynamics, Lung mechanics, Model approximation and simplification, Cardiovascular system, Respiratory system, Compartmental Models, Mass transport through diffusion and fluid flow, Multiple Model, Renal system, Membrane resting and action potential (Nerst equation), Immune system, Cable conduction model, Electrical conduction and Signal propagation in the nervous system, and Finite difference Model.

1712804 Radiobiology and Radionuclides	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course deals with: Absorption of the energy of ionizing radiation, Dependence of the biological effect on absorbed dose, Direct action of ionizing radiation, Indirect action of ionizing radiation, Response of the cell to the action of ionizing radiation, Biological effects of low doses of ionizing radiation and long term consequences.

1712805 Medical Instrumentation	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

This course deals with: Displacement sensors, Temperature and optical sensors, Amplifiers and signal processing, Cell, nerve, and muscle potentials, Electrocardiogram, Electrode polarization, Surface electrodes, Electrocardiograph, Power line interference, Blood pressure sensors, Heart sound sensors, Blood flow meters, Impedance plethysmography, Respiratory pressure and flow, Respiratory gas concentration, Blood-gas sensors, Noninvasive blood-gas sensors, Clinical laboratory measurements, Radiography, MRI, Ultrasonic imaging, Pacemakers and defibrillators, Cardiac assist devices, Electroshock hazards, and Electroshock protection.

1712806 Mechanics of Human Movement	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

The course topics include: Dynamics of muscle and tendon, Models of muscle contraction, Kinematics and dynamics of the human body, Methods for generating equations of motion, Mechanics of proprioceptors and other sensors, Analysis of human movement, including gait, running, and balance, Computer simulations, and Discussion of experimental measurement techniques.

1712807 Biosolid and Biofluid Mechanics	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

Laws for bio-viscoelastic fluids, solids and mixtures, Mechanical properties of blood vessels, ligaments, muscle, bone, and cartilage, Nonlinear continuum, and Multiphasic models of tissues.Physiological fluid dynamics, Aquatic animal propulsion, Animal flight, Respiratory flow patterns, Blood flow and pulse propagation, and Rheology of blood flow in the microcirculation.

1712808 Introduction to Theoretical Molecular Biophysics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**2**	**3**

The Introduction to Theoretical Molecular Biophysics is designed for students who are interested in the theoretical principles of biophysics, structural biology and biomathematics. The course consists of: An introduction to mathematical methods useful in theoretical molecular biophysics, Quantum mechanical description of molecules, Computational approaches to calculate properties of molecules of biological interest, Fundamental concepts of electrostatics for describing microscopic and macroscopic representations of the dielectric effects of solvating environments, Importance of solvation in biological processes, Molecular mechanical representation of systems and ensembles, Force field and energy expression.

1712809 Methods in Molecular and Cellular Biophysics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

This course will emphasize the biophysical principles and the experimental approaches in the following areas: Fluorescence Techniques and applications in Biology, Nuclear Magnetic Resonance Structure and Spectroscopy in Biology, and X-ray Diffraction Analysis of Structure and Function of Macromolecules.

1712810 Mathematical Methods II	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

This course presents a range of mathematical and computational methods and concepts needed in the analysis of a wide range of medical and biological phenomena. Here the emphasis is on understanding the mathematical methods, not specifically on their applications to scientific problems. Topics treated vary according to the interests and prior mathematical experience of the participants, which, minimally, should include: Linear algebra, Advanced calculus, and Differential equations.

1712811 Advanced Signal Processing	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Advanced signal processing techniques include: General orthonormal bases, SVD methods, Pattern recognition/classification, Spectral estimation, including classical and modern, Time-frequency and time-scale, Nonlinear filtering, including rank order filtering, and Illustrations will be drawn from a variety of signals and images. Random processes are an important component of the methods.

1712812 Proteome Informatics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Introduction to proteomics, from experimental procedures to data organization and analysis. Basic syllabus: Sample preparation and separations, Mass spectrometry, Database search analysis, De novo sequence analysis, Characterizing post translational modifications, Medical applications, 2-D gels, Protein-protein interactions, and Protein microarrays.

	Hour/Week		
1712813 Introduction to Modern Biomaterials	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

The course topics include: Chemical, physical, and biological properties of synthetic polymer, metal, and ceramic biomaterials, Relationship between the structure of biomaterials and their interaction with blood, soft, and hard tissue, Mechanical properties, fabrication, and degradation mechanisms, and performance testing of materials in biomedical use, Regulatory aspects, and laboratory experiences in material covered in the lecture.

	Hour/Week		
1712814 Biological Micro- and Nanotechnology	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

Many life processes occur at small size-scales. This course covers: Scaling laws, Biological solutions to coping with or taking advantage of small size, Micro- and nanofabrication techniques, Biochemistry and biomedical applications (genomics, proteomics, cell biology, diagnostics, etc.), and Emphasis on micro fluidics, surface science, and non-traditional fabrication techniques.

	Hour/Week		
1712815 Biocompatibility	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

This course covers: Biocompatibility of soluble and insoluble (cross-linked) polymers, Biocompatibility of biomaterials used as implants, blood substitutes, and carriers of bioactive molecules, Biorecognition of synthetic macromolecules on cellular and subcellular levels, and Biodegradability and immunogenicity of biomaterials.

	Hour/Week		
1712816 Fundamental Neuroscience	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

Students are exposed to fundamental concepts and techniques in molecular and cellular neuroscience and provided with a theoretical context for experimental analysis of brain function. The course reviews the biophysical and molecular concepts relating to membrane excitability, action potential generation and propagation, and the molecular basis of chemical signaling at synapses. Mechanisms and models of synaptic integration and plasticity with emphasis on how molecular changes translate into altered synaptic strength and gene expression programs. Historical and current concepts in neural pattern formation, neural migration, axon guidance and synapse formation. Specific brain disorders such as epilepsy, depression, schizophrenia, and Alzheimer’s disease and current models used to investigate their origin and/or treatment.

	Hour/Week		
1712817 Journal Club in Medical Biophysics II	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

Students will be instructed on the standard methods of preparing research experimental design as well as of writing and criticizing scientific research papers and thesis. Moreover, every student will present a recent journal article in the area of biophysics, physiology, biomedical engineering, or structural biology. The article will be approved by the course director. There will be one presentation per term. The student will discuss in detail the article, the methodologies used and whether these were appropriate for the experiments carried out. The presentation should be 45 minutes with 15 minutes for questions and discussion, with the course director's permission, students will be able to present their own data instead of a journal article.

	Hour/Week		
1712820 Medical Biophysics II	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

The purpose of this course is to extend student's understanding of medical biophysics for advanced applications in biomedical research. This course presents a practical approach to cutting-edge medical biophysics techniques. The course will cover recent advances of medical biophysics. Topics covered will include: Beer's-Lambert law, determination of trace elements using mass spectrographs and atomic absorption, experimental determination of action potential in human, nanotechnology and applications in medicine, and mathematical modeling of physiological systems.

	Hour/Week		
1712821 Biophysics of Proteins and Nucleic Acids – II	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

This is a course for advanced level study of biomolecular structure and function from a theoretical perspective. The focus is on studies of proteins and nucleic acids illustrating current methods of research on these topics: Brief review of the fundamental concepts in molecular and macromolecular structure, Survey of definitions and computational methods for the calculation of intermolecular forces, molecular dynamics and protein folding, Biophysics and energetics of enzymatic reactions as an illustration of fundamental concepts and methods in the study of biological mechanisms, and Structures and properties of DNA and some protein/DNA complexes presented in the same general context of biophysical concepts and molecular computations.

	Hour/Week		
1712822 Fundamentals of Tissue Engineering – II	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

Course topics include: Cellular attachment, Extracellular matrix biochemistry and tissue organization, Cell culture, Synthetic polymetric membranes, Methods of cell encapsulation, Biohybrid artificial organs, and Artificial cells, skin, bone, cartilage, liver.

	Hour/Week		
1712823 Introduction to Mathematical Modeling in Medical Biophysics – II	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

The introductory transdisciplinary course is designed to introduce students to important problems in a wide variety of fields of biology and medicine in which mathematical methods can be employed effectively. In many of these problems the more traditional methods of laboratory experiment, clinical trials, and field observation may be difficult, if not virtually impossible, to use. Topics range from: Population biology, Systems physiology, Clinical problems in medicine, and Cell and molecular biology. The emphasis is on qualitative rather than numerical studies, and on analytic methods rather than computer simulation. Open problems are indicated.

	Hour/Week		
1712824 Advances in Radiological Biophysics and Dosimetry – II	**Theoretical**	**Practical**	**Total Cr**
	2	2	3

This course deals with theory and measurement of radiation as applied to medicine and the laboratory. It covers ionizing sources as used in biology, diagnostic radiology, nuclear medicine, and radiation therapy. Topics include: ICRU definitions of radiation quantities, Regulations and enforcement, Radioactivity, Attenuation and scattering of photons and electrons, Interactions with tissue, Radiation equilibrium, External and internal dose estimation, Production of radioisotopes and radiopharmaceuticals, Convolution and Monte Carlo dose computations, Practical radiation dosimeters (ion chambers, diodes, TLD, film, chemical), Instrumentation for emission imaging, Gamma Camera, Single Photon Emission Computerized Tomography, Positron Emission Tomography, Radioactive waste issues, radon gas, emergencies, and wide variety of radiation sources from health physics perspective, and Radiation risks and radiation protection guidelines, including international current regulations.

1712825 Advances in Biomedical Engineering – II	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	2	3
This course is designed as an introduction to some of the electrical and computer engineering contributions to biomedical engineering, with particular emphasis given to related on-going departmental research. Course topics are: Background of general human anatomy and physiology, Background of electrophysiology, Modeling, recording and automated analysis of the electroencephalogram (EEG). Clinical applications, Modeling, recording and automated analysis of the electromyogram (EMG). Clinical applications, Modeling, recording and automated analysis of the electrocardiogram (EKG). Clinical applications, Modeling of neural networks. Clinical applications and medical imaging techniques (computerized tomography, magnetic resonance imaging and ultrasonic imaging).			

1712826 Biotransport – II	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	2	3
This course deals with fundamentals of mass and heat transport as they relate to living systems. The course topics include: Convection, Diffusion, Active transport, Osmosis, Conservation of momentum, Mass and energy as applied to cellular and organ level transport, and Examples from circulatory, respiratory, renal and ocular physiology will be examined.			

Master Degree in Human genetics

1713700 - Department of Human Genetics

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine, B.Sc. of Science or Pharmacy.

Core Courses (26 Cr): 1713701,1713702,1713703, 1713704, 1713705, 1713706, 1713707,1713708, 1713709, 1713710, 1713711, 1713712,1713713, 1713714,

Elective Courses (4 Cr): 1713715,1713716,1713717,1713718,1713719,1713721,1713722, 1713723, 1708720, 1718721, 1713724.

Thesis: (8 Cr)

Core Courses (26 Cr)

Code	Name	Hours/Week		
		Theoretical	**Practical**	**Total Cr**
1713701	Basic Human Genetics	3	--	3
1713702	Prevention & Treatment of Genetic Disorders	3	--	3
1713703	Molecular Genetics	2	2	3
1713704	Biochemical Genetics	2	2	3
1713705	Population Genetics	2	--	2
1713706	Special Genetics	2	--	2
1713707	Recent Topics	1	--	1
1713708	Clinical Cytogenetics*****	2	2	3
1713709	Clinical Genetics I *****	2	2	3
1713710	Clinical Genetics II*****	2	2	3
1713711	Cytogenetics ******	1	2	2
1713712	Biochemical Genetics I******	2	2	3
1713713	Biochemical Genetics II******	2	2	3
1713714	Genes & Diseases******	1	--	1
		21	10	26

	Name	Hours/Week		
Elective courses (4 Cr)		**Theoretical**	**Practical**	**Total Cr**
1713715	Embryology	1	--	1
1713716	Genetics of reproductive disorders	2	--	2
1713717	Genomics I	1	--	1
1713718	Special biochemical genetics	1	2	2
1713719	Special clinical genetics	1	2	2
1713721	Proteomics and bioinformatics	2	--	2
1713722	Pharmacogenetics	2	--	2
1713723	Blood genetic disorders	1	2	2
1708720	Immunology	1	2	2
1718721	Radiodiagnosis	1	2	2
1713724	Genetic epidemiology	2	--	2

*****: Compulsory for Medical students
****:** Compulsary for non Medical students

Master Degree in Molecular Epidemiology

1713700 - Department of Human Genetics

Admission Requirements: Graduate students with M.B.Ch.B. of Medicine, B.Sc. of Science, Dentistry or Pharmacy.

Core Courses (24 Cr): 1713780, 1713781, 1713782, 1713783, 1713784,1713785, 1713786, 1721701.

Elective Courses (6 Cr): 1713787,1721702, 1721704**,** 1713788

PM.Sc. Thesis: (8 Cr)

Core Courses (24 Cr)

Code	Name	Hours/ Week		
		Theoretical	Practical	Total Cr
1713780	Principles of human genetics	2	--	2
1713781	Diseases with Complex Inheritance	2		2
1713782	Genetic Epidemiology	2	-	2
1713783	Basic Molecular Biology and Genetics	3	2	4
1713784	Genomics Database	3	2	4
1713785	Molecular Epidemiology	2	2	3
1713786	Principles of Epidemiology	3	--	3
1721701	Principles of Medical Statistics	2	4	4
		19	10	24

Elective courses (6 Cr)		Hours/Week		
		Theoretical	Practical	Total Cr
1713787	Human Genetic Applications	2	--	2
1721702	Principles of Medical Research Designs	3	2	4
1721704	Regression Analysis	2	2	3
1713788	Recent topics	1	--	1

Prerequisit for PhD

1713800 - Department of Human Genetics

Admission requirements: All students with an MSc in a field relevant to Human Genetics, the student should sit for a supplementary course (15 CH) and pass a qualifying exam to be eligible to register to PhD in Human Genetics.

Core courses (6Cr): 1713821, 1713822

Elective courses **(7Cr):** 1713823,1713724, 1713825, 1713826

Core courses (6Cr)

Code	Name	Hours/Week		
		Theoretical	**Practical**	**Total Cr**
1713821	Basic Human Genetics	3	--	3
1713822	Basic Molecular Genetics	2	2	3
Elective courses (7Cr)				
1713823	Basic biochemical genetics	2	2	3
1713824	Clinical Genetics	3	2	4
1713825	Special Biochemical Genetics	3	2	4
1713826	Cytogenetics	2	2	3

Doctor of Philosophy in Human Genetics

1713800 - Department of Human Genetics

Admission Requirements: Postgraduate students with a M.Sc. in Human Genetics.

Core Courses (22 Cr):1713801, 1713802, 1713803,1713804,1713807,1713808, 1713810,1713812,1713805,1713806,1713809, 1713811**,**17138013, 17138014, 17138015, 1713816,

Elective Courses (2 Cr): 1713817,1713818, 1713827,,1718821,

Ph.D. Thesis: (24 Cr).

Core Courses (22 Cr)

Code	Name	Hours/ Week		
		Theoretical	**Practical**	**Total Cr**
1713801	Advanced Genetics I	2	--	2
1713802	Advanced Genetics II	1	2	2
1713803	Advanced Genetics III	2	-	2
1713804	Clinical Genetic Applications	1	--	1
1713807	Approach to Specific Disorders II	1	2	2
1713808	Approach to Specific Disorders III	2	--	2
1713810	Approach to Specific Disorders V	1	2	2
1713812	Approach to Specific Disorders VII	1	2	2
1713805*	Approach to Clinical Problems	1	--	1
1713806*	Approach to Specific Disorders I	1	2	2
1713809*	Approach to Specific Disorders IV	1	2	2
1713811*	Approach to Specific Disorders VI	1	2	2
1713813**	Advanced biochemical genetics I	1	--	1
1713814**	Advanced biochemical genetics II	1	2	2
1713815**	Genomic Basis of Diseases	1	2	2
1713816**	Approach to Specific Disorders IX	1	2	2
		15	14	22

Elective courses (2 Cr)

Code	Name	Hours/ Week		
		Theoretical	**Practical**	**Total Cr**
1713817	Genomics II	2	--	2
1713818	Special Clinical Genetics	1	2	2
1713827	Embryology	2	--	2
1718821	Radiodiagnosis	1	2	2

*: *compulsory for medical students*

**: *compulsory for non medical students*

Description of the Courses Offered by Human genetics Department

1713701 Basic Human Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
3	--	3

Introduction, chromosomal basis of heredity, structure and function of genes and chromosomes, patterns of single gene disorders, teratogens, and gene mapping and human genome proje**ct**

1713702 Prevention & Treatment of Genetic Disorders

Hours/Week		
Theoretical	**Practical**	**Total Cr**
3	--	3

Population screening, prenatal diagnosis, genetic counseling and treatment of genetic disorders

1713703 Molecular Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Tools of human molecular genetics, mutation and polymorphism, principles of molecular disease and disorders of haemoglobin.

1713704 Biochemical Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

ntroduction, housekeeping and speciality genes, hyperphenyl- alaninemias, mucopolysaccharidoses, homocystinuria, newborn screening, heterozygote screening, fragile X and familial hypercholestrolemia

1713705 Population Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

enetic variation in populations: Genetic diversity in human populations, Phenotypes, genotypes, and gene frequencies, Hardy Weinberg law and genetics of disorders with complex inheritance: quantitative traits, qualitative traits.

1713706 Special Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Cancer genetics; genetic basis of cancer, oncogenes, tumor suppressor genes, cancer and the environment and immunogenetics; the majorhistocompatability complex, immunoglobulins, single gene disorders of the immune system

1713707 Recent Topics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

Recent topics on clinical genetics, cytogenetics, biochemical genetics,molecular genetics, population genetics and clinical cytogenetics

1713708 Clinical Cytogenetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Principles of clinical cytogenetics, chromosomal abnormalities,disorders of autosomes. disorders of sex chromosomes and clinical atlas of human chromosomes.

1713709 Clinical Genetics I

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Clinical approach to the dysmorphic child, genetic assessment and pedigree analysis, short stature, chondrodysplasias, branchial arch syndromes, craniofacial disorders, muscle dystrophies and deafness.

1713710 Clinical Genetics II

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Recognizable patterns of human malformation, genetics aspects of developments, clinical aspect of human teratology, neural tube defects, limb defects as a major symptom, congenital myopathies and spinal muscle atrophies, and abnormal body size and proportion (overgrowth syndromes).

1713711 Cytogenetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	3

Introduction to cytogenetics, normal chromosomes, chromosomalabnormalities cytogenetic techniques and Mendelian disorders with cytogenetic effects,.

1713712 Biochemical Genetics I

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Disorders of amino acid metabolism excluding hyperphenylalaninemias, urea cycle disorders, disorders of carbohydrate metabolism, disorders of purine metabolism, disorders of pyrimidine metabolism and congenital disorders of protein glycosylation

1713713 Biochemical Genetics II

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Disorders of fatty acid metabolism, peroxisomal disorders, disorders of mineral metabolism, sphingolipidoses, gangliosidoses- oligosaccharidoses and body mass, lipodystrophies excluding familial hypercholestrolemia

1713714 Genes and Diseases

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

Genes and diseases of blood, immune and lymphatic system, genes and diseases in cancer and genes and diseases in gastrointestinal, cardiac, renal, respiratory and skin.

1713715 Embryology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

Selected topics on genetics of: development of the brain, development of the skeletal system, development of the reproductive system and development of the heart

1713616 Genetics of reproductive disorders

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Genetic causes of male infertility, genetic causes of female infertilityand sex anomalies.

1713717 Genomics I

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

Definitions of genomics and bioinformatics , DNA sequencing for the detection of human genome variation, genome wide association studies and genotyping technologies, and potential of genomics for health care.

1713718 Special biochemical genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Recent advances of inborn errors of amino acid, carbohydrate, oligosacharides, mucvopolysacharides, shingolipids, mineral, hormonal and peroxisomal metabolism.

1713719 Special clinical genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Hand malformations ; polydactyly, ectrodactyly, brachydactyly, and syndactyly.

1713721 Proteomics and bioinformatics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Proteomics technologies, Recent developments in proteome informatics for mass spectrometry analysis and bioinformatics and data mining in proteomics

1713722 Pharmacogenetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Pharmacogenetics; fundamental aspects of clinical pharmacology, phase I and phase II metabolism, monogenic pharmacogenetic disorders, ethnic difference in gene-drug interaction, pharmcogenomics; polygenic multifactorial pharmacogenomic disordes, phenotype-Genotype association studies and individualized therapy

1713723 Blood genetic disorders

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Molecular basis of: thalassemia, sickle cell anemia, membrane disorders , thrombophelia, leukemia, lymphoma, coagulation disorders and other blood disorders.

1713724 Genetic epidemiology

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Burden of genetic diseases, prevalence, incidence and frequency of genetic disorders, human genome, modes of inheritance, classic and non-classic gene mapping

1713780 Principles Human Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Introduction, chromosomal basis of heredity, structure and function of genes and chromosomes, patterns of single gene disorders, teratogens, gene mapping and human genome project

1713781 Diseases with complex inheritance	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Genetics of common disorders with complex inheritance:qualitative and quantitative traits, genetic and environmental modifiers of single gene disorders, examples of multifactorial traits for which genetic and environmental factors are known.

1713782 Advanced GeneticEpidemiology	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Modern genetic epidemiology, population genetics, evolution segregation analysis, linkage analysis, estimation of gene frequency and estimation of factors affecting genetic structure of the population.

1713783 Basic Molecular Biology and Genetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

Cell biology, pathogenetic model for major chronic diseases, laboratory safety and PCR and other selected molecular techniques.

1713784 Genomics Database	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

Basic molecular approaches to identify components that are relevant to human diseases, modern molecular biology and genomics technologies including gene cloning and sequencing, microarray expression analysis, protein isolation and identification, as well as marker-assisted genome mapping.

1713785 Molecular Epidemiology	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Issues in sample collection, processing and storage, ethical issues, record linkages and meta analysis and pooled analysis.

1713786 Principles of Epidemiology	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	-	3

History of epidemiology, components of epidemiology, purpose of epidemiology two broad types of epidemiology: the basic triad of descriptive epidemiology and analytic epidemiology, natural history of disease, levels of prevention and life cycle of the disease

1713787 Human Genetic Applications	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Genetic counseling &risk estimation in genetic counseling, genetic assessment and pedigree analysis, Genetic testing, therapy and ethical and social issues in human genetics

1713688 Recent Topics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Recent Topics;population genetics, molecular genetics, clinical genetics, genomics, proteomics and diseases with complex inheritance.

1**713801** Advanced Genetics I	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

History of medical genetics, nature and frequency of genetic disease. genomics and proteomics, genome structure and gene expression, epigenetics, mutations in human genetic diseases, segregation analysis, population genetics and twins and twining.

1713802 Advanced Genetics II	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Mitochondrial genes in degenerative diseases , cancer and aging, multifactorial inheritance and complex diseases and pathogenetics of diseases.

1713803 Advanced Genetics III	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Genetic epidemiology, human developmental genetics, the molecular biology of cancer, the biological basis of aging, pharmacogenetics and pharmacogenomics, susceptibility and response to infection an transplantation genetics.

1713804 Clinical Genetic Applications	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

Heterozygote testing and carrier screening, prenatal screening for neural tube defects and Down syndrome, prenatal diagnosis, neonatal screening, cytogenetic analysis, diagnostic molecular genetics, forensic genetics, bioinformatics, strategies for treatment of genetic disorders and ethical and social issues in clinical genetics, legal issues in genetic medicine

1713805 Approach to Clinical Problems	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

The genetic basis of human female infertility, male infertility, fetal loss, abnormal body size and proportions and human malformations

1713806 Approach to Specific Disorders I	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Chromosomal Disorders; clinical genetics of autosomal trisomies, sex chromosome abnormalities and deletions and other structural abnormalities of the autosomes.

1713807 Approach to Specific Disorders II	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Metabolic disorders ; disorders of body mass, genetic lipodystrophies, amino acid metabolism, disorders of carbohydrate metabolism, congenital disorders of protein glycosylation, purine and pyrimidine metabolism, lipoprotein and lipid metabolism, disorders of fatty acid transport and mitochondrial oxidation, organic acidemias and disorders of fatty acid oxidation, vitamin D metabolism or action, inherited porphyrias, copper metabolism, iron metabolism and related disorders, mucopolysaccharidoses, oligosaccharidoses, sphingolipid disorders, disorders of protein glycosylation and peroxisomal disorders, diagnostic procedures, function tests and postmortem protocol.

1713808 Approch to Specific Disorders III	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Genetics of cardiovascular disorders; congenital heart disease, inherited cardiomyopathies, primary pulmonary hypertension, hereditary hemorrhagic telangiectasia, hereditary disorders of lymphatic and venous systems, familial dysrhythmias, and conduction disorders, molecular basis of hypertension, preeclampsia, common genetic determinants of coagulation and fibrinolysis and genetic disorders of atherosclerosis respiratory disorders; cystic fibrosis, asthma, hereditary pulmonary emphysema and interstitial and restrictive pulmonary disorders, renal disorders; congenital disorders of urinary tract, cystic diseases of the kidney, nephrotic syndrome, renal tubular disorders and cancer of the kidney and urinary tract, and gastrointestinal disorders; inflammatory bowl disease, bile pigment metabolism and its disorders and cancer of the colon and gastrointestinal tract

1713809 Approch to Specific Disorders IV	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Craniofacial disorders; clefting, dental and craniofacial syndromes, craniosynostosis, skeletal disorders; disorders predisposing to bbone fragility, disorders with increased bone density, chondrodysplasia, abnormalities of bone structure, dysostoses, arthrogryposis, common skeletal deformaties and hereditary non inflammatory arthropathies connective tissue disorders; Marfan syndrome, Ehler Danlos syndrome and heritable diseases affecting the elastic tissues and recognizable pattern of human malformations

1713810 Approch to Specific Disorders V	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Genetics of hematologic disorders; hemoglobinopathies and thalassemias, hemophilias, rhesus and other fetomaternal incompatibilities, leukemias and lymphomas, immunological disorders; genetics and immunologic mechansims, systemic lupus, rheumatoid disease, amyloidosis, immune deficiency disorders, complement defects and disorders of leucocyte function and endocrinological disorders; genetic disorders of pituitary, thyroid, parathyroid, adrenal glands and diabetes mellitus.

1713811 Approch to Specific Disorders VI	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Genetics of ophthalmologic disorders; color vision defects, optic atrophy and congenital blindness, glaucoma, defects of the cornea, anomalies of the lens, hereditary retinal and choroidal degenerations, strabismus and retinoblastoma, hereditary hearing loss and deafness and dermatologic disorders; abnormities of pigmentation, icthyosiform dermatoses, epidermolysis bullosa, ectodermal dysplasias and skin cancer.

1713812 Approch to Specific Disorders VII	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Genetics of neurologic disorders; genetic disorders of basal ganglia and cerebral cortical development, neural tube defects, genetic aspects of human epilepsy, genetics of tic disorders, hereditary ataxias, hereditary spastic paraplegias, autonomic and sensory disorders, phakomatosis, multiple sclerosis, cerebrovascular disorders and primary tumours of the central nervous system and neuromuscular disorders; congenital muscle dystrophies, Duchenne and other X linked muscle dystrophies, autosomally inherited muscle dystrophies, hereditary motor and sensory neurophathies, congenital myopathies, spinal muscle atrophy, nondystrophic myotonias and periodic paralysis, myotonic dystrophies, hereditary and autoimmune myasthenias and motor neuron disease.

1713813 Advanced biochemical genetics I

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

Mechanisms of development, embryonic stem cell, adult stem cell, cancer stem cell, and cell signaling.

1713814 Advanced biochemical genetics II

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Recent trends in biochemical genetics; carbohydrate, amino acid and transport, disorders of lipid and bile acid metabolism, organelle related disorders; peroxisome, lysosomes and golgi and pregolgi systems, disorders of metal transport, vitamins responsive disorders and disorders of nucleic acid and haem metabolism.

1713815 Advaned biohemical genetics III

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Course description : genome structure, genome evolution, genomic rearrangement and disease trait, functional aspects of genome structure, genomic disorders; modeling and assays.

1713816 Approach to Specific Disorders IX

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Metabolic and molecular basis of eye disorders, metabolic and molecular basis of deafness, metabolic and molecular basis of skin disorders.

1713817 Genomics II

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

Genomics and health; cardiology, oncology, obesity, inflammatory diseases and infectious diseases.

1713818 Special clinical genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Hand malformations; syndromes with hand malformations.

1713821 Basic Human Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
3	-	3

Introduction, chromosomal basis of heredity, structure and function of genes and chromosomes, patterns of single gene disorders, teratogens, and gene mapping and human genome project.

1713822 Basic Molecular Genetics

Hours/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Tools of human molecular genetics, mutation and polymorphism, principles of molecular disease and disorders of haemoglobin.

1713823 Basic Biochemical Genetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3
Introduction, housekeeping and speciality genes, hyperphenyl- alaninemias, mucopolysaccharidoses, homocystinuria, newborn screening, heterozygote screening, fragile X and familial hypercholestrolemia			

1713824 Clinical genetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	1	4
Clinical approach to dysmorphic child, role of genetics in deafness, genetic basis of craniofacial disorders, short stature and muscular dystrophy, role of cytogenetics in medicine and cancer, chromosome abnormalities, chromosomes in human meiosis, Mendelian disorders with cytogenetic effects, clinical cytogenetics disorders of autosomes and sex chromosomes.			

1713825 Special biochemical genetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4
Introduction, housekeeping and specialitygenes, mucopolysaccharidoses, homocystinuria, newborn screening, heterozygote screening, fragile X and familial hypercholesterolemia, disorders of amino acid metabolism urea cycle, carbohydrate metabolism, purine metabolism, pyrimidine metabolism and congenital disorders of protein glycosylation.			

1713826 Cytogenetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3
Introduction to cytogenetics, normal chromosomes, chromosomal abnormalities, cytogenetic techniques and Mendelian disorders with cytogenetic effects.			

1713720 Human Genetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2
Gene structure and function, normal human chromosomes, abnormal human chromosomes, inheritance, mutation, polymorphism, molecular basis of genetic diseases, biochemical genetics, selected topics.			

1713820 Human Genetics	**Hours/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3
Genome structure and function, cytogenetics, Mendelian inheritance and multifactorial inheritance, genome mutation, polymorphism, molecular basis of biochemical genetic diseases, treatment of genetic diseases, selected topics.			

Master Degree in Experimental Surgery

1714700 - Department of Experimental and Clinical Surgery

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine.

Core Courses (26 **Cr**)**:** 1709740, 1714701, 1714702, 1714703, 1714704, 1714705, 1714706, 1714707, 1714708

Elective Courses (4 Cr): 1714709, 1714710 **,**1714711,1710720

M.Sc. Thesis: (8 Cr)

Core Courses (26 Cr)

Code	Name	Hours / Week		
		Theoretical	Practical	Total Cr
1709740	Basics in Laboratory Animal Science	1	2	2
1714701	Basic Consideration in Experimental Surgery	1	2	2
1714702	Fundamentals of Experimental Surgery	1	2	2
1714703	Basic Applied Surgery	1	2	2
1714704	Fundamentals in Applied Surgery	1	2	2
1714705	Advanced Surgery I	2	4	4
1714706	Advanced Surgery II	2	4	4
1714707	Advanced Surgery III	2	4	4
1714708	Advanced Surgery IV	2	4	4
		13	**26**	**26**

Elective Courses (4 Cr)

1714709	Experimental Microvascular Surgery	1	2	2
1714710	Experimental Transplantation	1	2	2
1714711	Laparoscopic Surgery I	1	2	2
1710721	Pathology	1	2	2

Medical Doctor in Experimental Surgery

1714800 - Department of Experimental and Clinical Surgery

Admission Requirements: Postgraduate students with a M.Sc. or an equivalent degree in Surgery or Experimental Surgery.

Core Courses (20 Cr): 1709840, 1714801, 1714802, 1714803, 1714804, 1714805, 1714806, 1714807, 1714808

Elective Courses (4 Cr): 1714810, 1714811, 1714812, 1714813, 1714814**,**1710821 .

M.D. Thesis: (24 Cr)

Core Courses (20Cr)

Code	Name	Hours / Week		
		Theoretical	Practical	Total Cr
1709840	Advanced Laboratory Animal Science	1	2	2
1714801	Experimental Pancreas Transplantation	1	2	2
1714802	Experimental Liver Transplantation	1	2	2
1714803	Advanced Science for Applied Surgery	2	4	4
1714804	Updating Surgery I	1	2	2
1714805	Updating Surgery II	1	2	2
1714806	Updating Surgery III	1	2	2
1714807	Updating Surgery IV	1	2	2
1714808	Updating Surgery V	1	2	2
		10	**20**	**20**

Elective Courses (4Cr)

1714810	Experimental Small Intestine Transplantation	1	2	2
1714811	Gastrointestinal Endoscopy	1	2	2
1714812	Endoscopic retrograde cholangiopancreatography	-	2	1
1714813	Gastrointestinal Motility Studies	-	2	1
1714814	Laparoscopic Surgery II	1	2	2
1710821	Pathology	2	2	3

Course Description of the courses offered by Experimental and Clinical Surgery Department

1714701 Basic Consideration in Experimental Surgery	Hour / Week		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**

The course aims to provide the student with the appropriate knowledge about legal, ethical & educational aspects, and to provide the student with the principles of surgical research laboratory and practical aspects. The course focuses on an appropriate background covering operative facilities, anesthesia facilities and post operative intensive care facilities.

1714702 Fundamentals of Experimental Surgery	Hour / Week		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**

This course aims to provide the student with an appropriate knowledge about experimental design, experimental tissue trauma & healing. Also, to provide the student with the principles of experimental oncogenesis, peritoneal adhesion and experimental models in portal hypertension.

1714703 Basic Applied Surgery	Hour / Week		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**

To provide the student with the appropriate knowledge about ethical aspects of medical practice, also about the principles of asepsis, sterilization & disinfections and antimicrobial therapy in surgery. Again the course aims to provide the student with an appropriate background covering computer and data base and how to write a protocol of a thesis

1714704 Fundamentals in Applied Surgery	Hour / Week		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**

the course aiming to provide the student with the appropriate knowledge about general surgical anatomy and general surgical pathology, also to provide the student with the principles of surgery & the immune–compromised and principles of ICU. Surgical audit and patient safety will be included in the course

1714705 Advanced Surgery I	Hour / Week		
	Theoretical	**Practical**	**Total Cr**
	2	**4**	**4**

To provide the student with the appropriate knowledge about anatomy of abdominal wall and groin and peritoneum, omentum and mesentery. Also, to provide the student with an appropriate background covering surgery of portal hypertension, GERD, soft tissue sarcoma, surgery of the breast together with their experimental applications. The course includes also principles of scrotal and testicular diseases

1714706 Advanced Surgery II	Hour / Week		
	Theoretical	**Practical**	**Total Cr**
	2	**4**	**4**

The course aims to provide the student with the appropriate knowledge about surgery of stomach & duodenum and upper & lower GIT bleeding. Also, to provide the student with the principles of intestinal obstruction and intestinal fistulae. The course also includes an appropriate background covering cancer colon & rectum, inflammatory bowel diseases, stomas, pelvic floor disorders and anal fissures, fistula & piles. Applications: experimental Upper GI and Lower GI endoscopy.

1714707 Advanced Surgery III

Hour / Week		
Theoretical	**Practical**	**Total Cr**
2	**4**	**4**

The course aims to provide the student with the appropriate knowledge about surgery of the liver and pancreas. The course provides also a broad based training in theoretical and applied in the principles of biliary surgery (cholecystitis, cholangitis, biliary strictures, obstructive jaundice, and biliary tumors). The course includes also an appropriate background covering splenic disorders, splenectomy, lymphadenopthy and lymphoma. Applications: experimental laparoscopic models.

1714708 Advanced Surgery IV

Hour / Week		
Theoretical	**Practical**	**Total Cr**
2	**4**	**4**

The course aims to provide the student with the appropriate knowledge about grafts and flaps, stages of wound healing, face and hand injuries, burns. Also, to provide the student with an appropriate background covering lower limb ischemia, varicose veins, DVT, post- phlebetic syndrome, diabetic foot infection, A-V fistulae, endovascular surgery. To illustrate thyroid tumors, goiter, parotid tumors, neck swellings. Also, to provide the student with the principles of urinary tract neoplasms and injuries. Applications: experimental flapping and vascular anastomosis.

1714709 Experimental Micro vascular Surgery

Hour / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

To provide the student with the appropriate knowledge about equipment & laboratory facilities. This course aims to highlight the principles of experimental design. Also, to provide the student with an appropriate background covering microvascular anastomosis.

1714710 Experimental Transplantation

Hour / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

The course aims to introduce the appropriate knowledge about assessments for experimental transplantation and ethical & legal aspects of transplantation. To provide the student with the principles of organ donation- laboratory techniques & donor-recipient match. To provide the student with an appropriate background covering renal transplantation & immune-suppression

1714711 Laparoscopic Surgery

Hour / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

To provide the student with the appropriate knowledge about fundamentals of laparoscopic surgery and medical malpractice in laparoscopic surgery. To provide the student with an appropriate background covering laparoscopic appendectomy and laparoscopic repair of inguinal and ventral hernias. Also to illustrate laparoscopic biliary surgery: laparoscopic cholecystectomy, cholangiography and CBD exploration and their applications on experimental models

1714801 Experimental PancreasTransplantation

Hour / Week		
Theoretical	**Practical**	**Total Cr**
1	**2**	**2**

To provide the student with the appropriate knowledge about anatomy and physiology of the pancreas, Islet cell transplantation and pancreas Xenotransplantation. Also, to provide the student with the principles of immunosuppressive drugs with an appropriate background covering immunology of allograft and risk of zonotic diseases.

1714802 Experimental Liver Trans plantation	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
This course gives a complete and appropriate knowledge about assessments for liver transplantation, liver transplant operation and immunosuppression after Liver Transplantation. It is aimed at providing sound knowledge with the principles of allograft immune response, pre- and post-transplant management of hepatitis C and medical management of the Liver transplant patient. To illustrate the dilemma of adult-to-adult living donor liver transplantation and management on the liver transplant waiting list			

1714803 Basic Science for Applied Surgery	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	2	**4**	**4**
To provide the student with the appropriate knowledge about ethical and legal aspects of medical practice and surgical practitioners and To provide the student with the principles of evidence based surgery and how to write a protocol of a thesis. Also the course aims to provide the student with the appropriate knowledge about regional surgical anatomy and Systemic surgical pathology.			

1714804 Updating Surgery I	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
To provide the student with the appropriate knowledge about surgical anatomy of the inguinal region, classification of inguinal hernia and pathophysiology, types of hernia repair. The course aims to provide sound and appropriate knowledge about benign, malignant breast disorders and recent advances for cancer breast.			

1714805 Updating Surgery II	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
To provide the student with the appropriate knowledge about GORD and its management, benign and malignant disorders of the stomach and duodenum. Also to provide the student with an appropriate background covering upper GIT bleeding and intestinal fistulae.			

1714806 Updating Surgery III	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
To provide the student with the appropriate knowledge about inflammatory bowel diseases, vascular disorders of colon, functional and structural colorectal disorders and colorectal neoplasia. To provide the student with the principles of anal surgery (Hemorrhoids, anal fissure, perianal abscess and fistula, anal cancer and faecal incontinence), To provide the student with the required knowledge, and skills to diagnose intestinal obstruction. To illustrate different types of stomas of GIT and their applications on experimental models			

1714807 Updating Surgery IV	**Hour / Week**		
	Theoretical	**Practical**	**Total Cr**
	1	**2**	**2**
To provide the student with the appropriate knowledge about anatomy and physiology of liver, liver imaging, disorders of hepatic vasculature and liver tumors. Also to provide the student with the appropriate knowledge about surgical anatomy and physiology of the biliary system, jaundice, cholangitis, gall stones, tumors of the biliary tract, pancreas, pancreatitis and pancreatic tumors. To provide the student with the required knowledge, and skills to detect cancer pancreas at an early stage and to show the plan of management for various stages of the disease. To focus on endocrine surgery: thyroid, parathyroid, adrenal gland surgery and Multiple Endocrine Neoplasia and carcinoid tumors			

1714808 Updating Surgery V	Hour / Week		
	Theoretical	Practical	Total Cr
	1	2	2

To provide the student with the appropriate knowledge about portal hypertension and its management with an appropriate background covering surgical anatomy of spleen, splenomegaly, splenectomy and lymphoma. The course also includes appropriate knowledge about acute and chronic limb ischemia, chronic venous insufficiency, diabetic foot disease, Lymphoedema, Varicose vein, Vascular access surgery and Sympathectomy. Applications: experimental models of portal hypertension, experimental microvascular surgery.

1714810 Experimental Small Intestine Transplantation	Hour / Week		
	Theoreical	Practical	Total Cr
	1	2	2t

To provide the student with the appropriate knowledge about experimental small intestine transplantation in animal models. The course reviews the concepts relating the principles of graft position and procedures, graft physiology and rejection reaction.

1714811 Gastrointestinal Endoscopy	Hour / Week		
	Theoreical	Practical	Total Cr
	1	2	2t

To provide the student with the appropriate knowledge about different endoscopic equipments, principles in techniques, infection control in endoscopy and risks: prevention and management. Outline diagnostic and therapeutic disorders. Monitor the effectiveness of upper and lower gastrointestinal endoscopy to control bleeding, diagnose tumors and their applications on experimental models

1714812 Endoscopic retrograde cholangiopancreatography	Hour / Week		
	Theoreical	Practical	Total Cr
	-	2	1

The course aims to provide the student with appropriate knowledge about fundamentals of ERCP, technique, indications, contraindications and complications. Also, to provide the student with an appropriate background covering its role in CBD stones, acute pancreatitis, management of post-surgical bile leaks, bile duct stricture and in pancreatico-biliary malignancies. Applications: experimental models.

1714813 Gastrointestinal Motility Studies	**Hour / Week**		
	Theoreical	**Practical**	**Total Cr**
	1	2	1

To provide the student with the appropriate knowledge about motility disorders of oesophagus and the use of oesophageal manometry. The course also includes appropriate background covering anal manometry, impedence manometry, sphincter of Oddi dysfunction and 24 h PH monitoring and their applications in experimental researches.

1714814 Laparoscopic Surgery II	**Hour / Week**		
	Theoreical	**Practical**	**Total Cr**
	1	2	2

To provide the student with the appropriate knowledge about fundamentals of laparoscopic surgery and medical malpractice in laparoscopic surgery. It is aimed at providing sound knowledge about laparoscopic appendectomy, laparoscopic colorectal surgery, laparoscopic obesity surgery, laparoscopic repair of inguinal and ventral hernias and reflux surgery. Also to illustrate laparoscopic biliary surgery: laparoscopic cholecystectomy, cholangiography and CBD exploration and its applications on experimental models.

1714720 surgery	**Hour / Week**		
	Theoreical	**Practical**	**Total Cr**
	1	2	2

The course aims to provide sound and appropriate knowledge about benign and malignant breast disorders and recent advances in management of cancer breast including oncogenesis
The course includes background covering of splenic disorders, lymphadenopathy and lymphoma and their surgical management.

1714820 surgery	**Hour / Week**		
	Theoreical	**Practical**	**Total Cr**
	2	2	3

The course aims to provide the student about the surgical anatomy of the stomach and colon, also provide the student about gastric and colonic tumors and skills of their detection early.
and to focus on endocrine surgery of thyroid diseases , including different modalities of surgical management.

Diploma Degree in Preventive Cardiology

1715600 – Department of Experimental and Clinical Internal Medicine
(Cardiology Unit)

Admission requirements: Graduate students with MB BCh of Medicine

Core courses: (26 **Cr**):1715610, 1715611 (A),1715611(B),1715612,1715613,1715614 (A),1715614 (B).

Elective courses: (4 **Cr**): 1715615, 1715616, 1715609

Core courses: (26Cr)

Code	Course	Hour / Week		
		Theoretical	**Practical**	**Total Cr**
1715610	Epidemiology of the heart	2	2	3
1715611(A)	Metabolic diseases and the heart	2	2	3
1715611(B)	Heart Failure	3	2	4
1715612	Drugs and the heart	3	2	4
1715613	Infections and trauma of the heart	3	2	4
1715614 (A)	Coronary artery disease	2	4	4
1715614(B)	Hypertension and arterial diseases	3	2	4
		18	16	26
Elective courses: (4 Cr)				
1715615	Genetics & hereditary factors in CVS disease	1	2	2
1715616	Cost-effectiveness in preventive cardiology	1	2	2
1715609	Cardiac rehabilitation	1	2	2

1715609 Cardiac rehabilitation & heart diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

asic principles of exercise physiology and of exercise training .
Effects of cardiac diseases on exercise performance.
Effects of cardiac rehabilitation on morbidity and mortality.
Practical aspects-nutritional, psychological, and vocational counceling.
Present problems and the future of cardiac rehabilitation.

1715610 Epidemiology of heart diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Scope of the problem: Past, present and Future, **Trends in Cardiovascular Disease:** Incidence and risk factor, **Screening for cardiovascular disease:** Exercise testing, ankle-brachial index, imaging modalities to detect asymptomatic individuals at high risk for cardiovascular events, **Cardiovascular risk factors:** Non-modifiable, Mdifiable, Minor, Novel Risk Factors, **Primary prevention - Secondary Prevention - International guidelines:** Implementation strategies, Barriers to implementation strategies, Physician-related methods to improve implementation of the guidelines, **Heart diseases in special population:** Women, children and adolescents and elderly. Occupational heart diseases: Occupational exposure and cardiovascular diseases

1715611(A) Metabolic Diseases & the heart	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- **Diabetes mellitus:** Diagnostic Criteria for Diabetes Mellitus, Epidemiology of Cardiovascular Disease in Diabetes Mellitus Pathophysiology of Diabetic Vascular Disease, Therapeutic Options for Diabetic Vascular Disease
- **Dyslipidemia**: Lipoprotein transport and disorders, Drugs affecting lipid metabolism, Trials in dyslipidemia management, Novel therapeutic targets
- **Nutrition and nutritional disorders:** Body weight as risk factor, Obesity and obesity indices, Imaging of body fat distribution, Management of obesity and overweight **Endocrine Disorders and Cardiovascular Disease**

1715611(B) Heart Failure	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

- **Heart Failure,**Pathophysiology
- **Clinical** aspects of heart failure.
- **Diagnosis and Treatment of acute and chronic heart failure**. Heart failure with preserved systolic function, diagnosis & management
- **Non**- pharmacological therapy of heart failure **.** Refractory heart failure .

Emerging Therapies and Strategies in the Treatment of Heart Failure.

1715612 Drugs & the heart	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

Cardioprotective drugs: β- blockers, Statins, Renin Antagonists, Angiotensin Converting Enzyme (ACE) Inhibitors, Angiotensin-Receptor Blockers (ARB's), Aldostreone-Receptor Antagonists, Calcium-Channel Blockers, Anti-platelets: ASA, Clopidogrel, Novel anti-platelets –Antiarrthytmic Drugs. Cardiovascular Drug Interactions - Contraceptive drugs- Addiction and Smoking cocaine, IV drug abuse, other recreational drugs

1715613 Infections & trauma of the hear	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

Rheumatic fever and valvular rheumatic heart disease. Infective endocarditis: Prophylaxis, diagnosis and management. Other bacterial diseases: Mycobacterium species, Chlamydia pneumonia, Mycoplasma pneumonia and Treponema palladium. Parasitic diseases: Shistosomiasis and Chagas disease. Viral diseases & myocarditis: Adenovirus, Coxsackie virus, Cytomegalovirus, Parvovirus B19, Hepatitis C virus, Influenza, Human immunodeficiency virus (HIV), Herpes virus and Epstein-Barr virus. Fungal diseases: Aspergillosis, Candida, Coccidioides, Cryptococcus, Histoplasma. Trauma of the heart: Penetrating, Blunt, Metabolic and Iatrogenic . Sports and the heart: Athletic heart disease and sudden cardiac death in athletes.

1715614 (A) Coronary Artery diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

Coronary artery disease: New paradigms in the pathophysiology of coronary artery disease, pathologic anatomy and pathogenesis, the atherosclerotic vulnerable plaques: pathophysiology, detection and treatment, endothelial function and insights for prevention.Biomarkers of inflammation as surrogate markers in detection of vulnerable plaques and vulnerable patients, global differences in atherosclerosis, regulation of coronary blood flow, coronary heart disease syndromes: pathophysiology and clinical recognition, silent ischemia, coronary disease in women. Exercise testing, coronary angiography, echocardiographic evaluation of coronary artery disease, myocardial perfusion imaging multislice computed tomography techniques, cardiac positron emission tomography, magnetic resonance imaging of the myocardium, and angiography
Treatment of stable angina, treatment of unstable angina, acute non–st-elevation myocardial infarction, and coronary artery spasm, treatment of acute st-elevation, myocardial infarction and non atherosclerotic coronary artery disease. Coronary artery bypass surgery and percutaneous coronary revascularization Complications of myocardial infarction. impact on morbidity and mortality in patients with coronary artery disease.

1715614 (B) Hypertension & Artery diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

Hypertension: Definition, prevalence, variability, and determinants ofhypertension, mechanisms of primary (Essential) hypertension.**Pathogenesis** of Hypertensive Heart Disease, **Diagnosis** and Initial Evaluation of Hypertension. Secondary Hypertension. Hypertensive Diseases of Women, hypertensive crisis, general **therapeutic** considerations. Antihypertensive **Drug Therapy**, special considerations in therapy, therapy for hypertensive crisesand future therapeutic perspectives .
Atherosclerosis: Endothelial function**.m**ediators of arterial diseases **,p**athogenesis of atherosclerosis **Diseases of the Aorta:** Aortic Aneurysms, Dissecting Aortic aneurysm, Aortitis. **Peripheral arterial diseases:** Epidemiology, risk factors for peripheral arterial disease, pathophysiology of peripheral arterial disease, clinical presentation, testing for peripheral arterial disease, prognosis and treatment, Renal artery disease,**carotid andcerebral-vascular** disorders

1715615 Genetics&hereditary factors in CVD	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Genetic information- DNA-based risk prediction- Pharmacogenetics- Genetically-determined cardiovascular diseases- Congenital heart diseases: risk factors and prevention, and management ,Cardiomyopathy ,Disorders of the Vasculature, Genetics of Cardiac Arrhythmias

1715616 Cost-effectiveness in preventive cardiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Pharmaco-economics: costs of intervention, Original versus generic drugs, Clinical trials in cardiology- Insurance coverage: population at risk, levels of coverage, costs of coverage ,Measurement and Improvement of Quality of Cardiovascular Care

1715605 Internal medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- History taking; & function: genetic control of protein synthesis, cell reproduction, transport of ions & molecules through the cell membrane.
- General medical examination of cardiovascular system
- Abdominal examination
- Neurological examination and peripheral neuropathic disease.
- Psychological disorders and its assessment.
- Musculoskeletal system., Respiratory system.
- Acute painful conditions

1715621 Internal Medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Sheet making.
- General examination.
- Chest examination.
- Abdomen examination.
- Heart examination.
- Neurological examination

1715720 Internal Medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

This course includes lectures about the etiology and the diagnosis of different diseases that affects the heart, liver, kidney and other metabolic diseases. By the end of the course students will be able to list and diagnose different systemic and metabolic diseases (clinically & laboratory). Also the student will be able to interpretate the result of laboratory investigation with the clinical condition of the patients and give an advice

1715820 Internal Medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

This course includes lectures about the etiology and the diagnosis of different diseases that affects the heart, liver, kidney and other metabolic diseases. By the end of the course students will be able to list and diagnose different systemic and metabolic diseases (clinically & laboratory). Also the student will be able to interpretate the result of laboratory investigation with the clinical condition of the patients and give an advice. Students should be able for creative thinking and could recommend further laboratory study.

1715821 Internal Medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	1	1.5

The overall aim of the course is to understand clinical medicine by providing to the postgraduate students detail of clinical techniques and explanation of physical signs.
The course is designed to improve practical skills of the postgraduate students through knowledge of general examination including (history taking symptoms and signs), cardiovascular system including (chief cardiovascular symptoms, and examination of precordium), chest (chest symptoms, and local chest examination) and finally abdomen included (abodminal symptoms and local abdominal examination)at the end of the course they are able to interpret complaint of the patient, with preliminary diagnosis based on history taking and clinical examination.

1715751 Chest diseases

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Clinical examination of the respiratory system-, Functional anatomy, physiology and investigations of the respiratory system, Obstructive pulmonary diseases, Bronchiectasis, Infections of the respiratory tract, -Diffuse parenchymal lung diseases , Sarcoidosis, Diseases of the pleura

1715752 Renal diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Acute renal failure, Chronic kidney disease and uremia, Glomerular diseases, Nephrotic syndrome, Asymptomatic urinary abnormalities, Urinary tract infection, Renal tubular defects, Acute (allergic) interstitial nephritis , Chronic interstitial nephritis, Polycystic kidney disease, Renal tubular acidosis , Nephrolithiasis

1715753 Endocrinal diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Disorders of the anterior pituitary and hypothalamus, Disorders of the posterior pituitiary, Disorders of the thyroid, Disorders of the adrenal gland, Hyperfunction of the adrenal gland, Hypofunction of the adrenal gland, Obesity, Diabetes mellitus

1715754 Cardiac disease**s**	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Clinical examination of the cardiovascular system, Disorders of heart rate, rhythm, and conduction, Coronary heart disease, Diseases of the heart valves, Diseases of the myocardium, Diseases of the pericardium, Congenital heart diseases

1715755 Internal medicine	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Common Symptoms, general and local examination, Molecular and genetic factors in disease, Environmental and nutritional factors in disease , Ageing and disease, Electrolyte disorders, Infectious disease, Kidney and urinary tract disease, Cardiovascular disease, Respiratory disease, Endocrine disease, Alimentary tract and pancreatic disease, Liver and biliary tract disease, Blood disease, Musculoskeletal disease, Neurological disease, Laboratory reference ranges

1715851 Chest diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Diagnostic procedures in respiratory diseases, obstructive pulmonary diseases, bronchiectasis-cystic fibrosis, infections of the respiratory tract.
- Diffuse parenchymal lung diseases (DPLDs), diseases of the pleura and mediastinum,respiratory failure, sleep disordered breathing and pulmonary vascular disease.
- Clinical measurements and case studies,

1715852 Renal diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Acute renal failure, Chronic kidney disease and uremia, Dialysis, Nephrotic syndrome, Asymptomatic urinary abnormalities, Urinary tract infection, Renal tubular defects, Acute (allergic) interstitial nephritis , Chronic interstitial nephritis, Cystic kidney disease, Renal tubular acidosis, Renovascular disease, Renal transplantation, Glomerular diseases, Urinary tract obstruction, Case studies

1715853 Endocrinal diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Disorders of the anterior pituitaryand hypothalamus: Disorders of the posterior pituitiary, Disorders of the thyroid, Disorders of the adrenal gland, Disorders of reproductive system, Adipokines , Diabetes mellitus, Clinical &lab measurements.
Problem solving, Case studies

1715854 Cardiac diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Diagnosis of cardiovascular disorders, Cardiac dysrhythmias , Coronary heart disease, Diseases of the heart valves, Vascular diseases, Diseases of the myocardium, Diseases of the pericardium, Congenital heart diseases.,
Radiology of the Heart, Echocardiography, Nuclear Cardiology and Computed Tomography, Cardiovascular Magnetic Resonance Imaging, Catheterization and Angiography.
Heart Failure: Pathophysiology and Diagnosis, Electrophysiologic and surgical Interventional Procedures . Miscellaneous Conditions of the Heart: Tumor, Trauma, and Systemic Disease.

Diploma Degree in Pain Medicine

1716600 Department of Anaesthesia

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine.

Core courses(26 Cr): 1716601,1716602(a) 1716602(b), 1716603(a),1716603(b) 1716604, 1718620,1715605, 1716606.

Elective courses(4 Cr): 1708620,1713620,1716620,1721720,1720721.

Core courses: (26Cr)

Code	Name	Hours/week		
		Theoretical	**Practical**	**Total**
1716601	Anatomy	1	2	2
1716602(a)	Acute pain I	1	4	3
1716602(b)	Acute pain II	1	6	4
1716603(a)	Chronic pain I	2	4	4
1716603(b)	Chronic pain II	2	4	4
1716604	pharmacology of pain	2	-	2
1718620	Radiodiagnosis	2	2	3
1715605	Internal medicine	1	2	2
1716606	Physiology of pain	2	-	2
		14	**24**	**26**

Elective courses(4 Cr)				
1708620	Immunology	1	-	1
1713620	Genetics	1	2	2
1716620	Infection control	1	-	1
1721720	Medical statistics	1	2	2
1720721	Computer	1	2	2

Master Degree in Pain Medicine

1716700 Department of Anaesthesia

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine.

Core courses(26 Cr): 1716701,1716702(a) 1716702(b), 1716703a, 1716703b 1716704, 1716706, 1718720, 1715605.

Elective courses(4 Cr): 1708720,1713720,1716720,1721720,1721721,1716770

M.Sc. Thesis: (8 **Cr**).

Core courses (26Cr)

Code	**Name**	**Hours/week**		
		Theoretical	Practical	Total Cr
1716701	Anatomy	1	2	2
1716702(a)	Acute pain I	1	4	3
1716702(b)	Acute pain II	1	6	4
1716703(a)	Chronic Pain I	2	4	4
1716703(b)	Chronic Pain II	2	4	4
1716706	Physiology of pain	2	-	2
1716704	pharmacology of pain	2	-	2
1718720	Radiodiagnosis	2	2	3
1715605	Internal medicine	1	2	2
		14	**24**	**26**
Elective courses(4 Cr)				
1708720	Immunology	1	2	2
1713720	Human Genetics	1	2	2
1716720	Infection control	2	-	2
1721720	Medical statistics	1	2	2
1716770	Psychological and neurological principles	٢	-	٢
1720721	Computer	1	2	2

Doctor of Philosophy in Pain Medicine

1716800-Department of Anaesthesia

Admission requirements: Graduate students with Master degree in pain medicine, anaesthesia or any equivalent degrees.

Core courses(20 C: 1716801, 1716802,1716803 ,1718822,1718823, 1716807,1716808, 1716809

Elective courses (4 Cr) 1721820,1708820,1716820,1722621,1716870

M,d Thesis: 24 **Cr**

Core Courses(24 Cr)

Code	Name	Hours/Wekk		
		Theoritical	Clinical	Total Cr
1716801	Anatamy y of pain	1	2	2
1716802	Physiology of pain	١	2	2
1716803	Pharmacology of pain	2	-	2
1718822	Radiodiagnosis	1	-	1
1718823	Radiodiagnosis	1	2	2
1716807	Acute pain	1	6	4
1716808	Chronic pain	2	4	4
1716809	Palliative care	1	4	3
		10	18	20
Elective Courses(4Cr)				
1721820	Medical Statistics	2	2	3
1708820	Immunologoy	2	2	3
1716820	Infection Control	1	-	1
1722621	Molecular Biology Of Pain	1	-	1
1716870	Psychological and Neurological Principles of pain	1	-	1

Description of the courses offered by Anaesthesia Department

Code	Hour/Week		
	Theoretical	Practical	Total Cr
1716601 Anatomy	1	2	2

It deals with the anatomy of the human body which is the basic science to learn and understand in order to adequately asses and manage pain., Anatomy of CNS, anatomical approach of head and neck nerve blocks., anatomical approach of ascending and descending tracts of pain , anatomical approach of autonomic nerve blocks.

1716602 (a) Acute Pain **I**	Hour/Week		
	Theoretical	Practical	Total Cr
	1	4	3

Introduction assessment, pathophysiology and management of acute pain, acute pain service Clinical course, Training in acute pain service in hospital, Candidate should attend round table discussion once a week during the course

1716602 (b) Acute Pain II	Hour/Week		
	Theoretical	Practical	Total Cr
	1	6	4

Basic principle in regional and neuroaxial blocks,obstetric analgesia,acute neuropathy,non surgical pain and more complex patients.
Clinical course, Make 5 successful attempts of neuroaxial on simulators then give a chance to make a trials on patients under supervision. Learn how to perform successful thoracic epidural ,paravertebral block, different peripheral nerve blocks using nerve stimulating and using Ultrasound guided technique. Candidate should provide at least 2 presentations during the course Candidate should attend round table discussion once a week during the course.

1716603 (a) Chronic Pain **I**	Hour/Week		
	Theoretical	Practical	Total Cr
	2	4	4

Introduction in chronic pain,Basic cognitive and psychologic aspect of pain. Basic principle in neuropathic pain assessment. Basic principle in Physiotherapy in pain management . Basic principle in Psychotherapy in pain management
Clinical course
Candidate should attend ,5 Neuropathic pain clinic, , One comprehensive pain programme, 5 intervention pain techniques.

1716603 (b) Chronic Pain **II**	Hour/Week		
	Theoretical	Practical	Total Cr
	2	4	4

Assessment and management in cancer pain syndrome, Basic principle in musclo-skeletal and soft tissue pain, Basic studying in Low back pain, Pain in eldery ,Pain in ICU, Pain in heamatology. Pain in children. Pain at the end of life. Basic principle in Radiotherapy and chemotherapy management of pain. Management of patients with Headache.
Clinical course
Candidate should attend , 5 Cancer pain clinic 5 Myoskeletal pain clinic, 5 intervention pain techniques ,Candidate should provide at least 2 presentations during the course.

1716604 Pharmacology **of pain**	Hour/Week		
	Theoretical	Practical	Total Cr
	2	**--**	**2**

- Mechanism of action of analgesic drugs.
- Pharmaco kinetics and Pharmaco dynamics
- Local anaesthetics.
- NSAID. , OPIDS.
- Neuroleptics-corticosteroids.
- Drugs interaction

1716606 Physiology of pain

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- Definition of pain, Membrane potentials and synapses..
- nociceptors.
- Neural pathway:fast and slow fibers.
- Neurotransmitters:excitatory and inhibitory
- Pain processing and transmission in spinal cord.
- Mopdulation(descending inhibition)
- Peripheral sensitization, Central sensitization

1716701 Anatomy

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- It deals with the anatomy of the human body which is the basic science to learn and understand in order to adequately asses and manage pain.
- Anatomy of CNS
- Anatomical approach to regional anaesthesia.
- Anatomical approach to somatic block of upper limb.
- Anatomical approach to somatic block of lower limb.
- Anatomical approach to somatic block of trunk.
- Anatomical approach of head and neck nerve blocks.
- Anatomical approach of ascending and descending tracts of pain.
- Anatomical approach of autonomic nerve blocks.

1716702 (a) Acute pain I

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	4	3

Introduction assessment, pathophysiology and management of acute pain, acute pain service, Quality assurance in acute pain,Mishaps in acute pain, Multimodal approach for pain management,Head trauma, Acute pancreatitis.

Clinical course, Training in acute pain service in hospital, Candidate should attend round table discussion once a week during the course.

1716702 (b) Acute pain **II**

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	6	4

Novel principle in regional and neuroaxial blocks,obstetric analgesia,acute neuropathy,non surgical pain and more complex patients.

Clinical course, Make 5 successful attempts of neuroaxial on simulators then give a chance to make a trials on patients under supervision. Learn how to perform successful thoracic epidural ,paravertebral block, different peripheral nerve blocks using nerve stimulating and using Ultrasound guided technique. Candidate should provide at least 2 presentations during the course Candidate should attend round table discussion once a week during the course.

1716703 (a) Chronic Pain **I**

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

Introduction in chronic pain, cognitive and psychologic aspect of pain. Recent advances in neuropathic pain assessment. Recent advances in Physiotherapy in pain management . Recent advances in Psychotherapy in pain management .

Clinical course

Candidate should attend ,5 Neuropathic pain clinic, One comprehensive pain programme, 5 intervention pain techniques.

1716703 (b) Chronic Pain **II**	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

Assessment and management in cancer pain syndrome, in musclo-skeletal and soft tissue pain, Recent studying in Low back pain, Pain in eldery ,Pain in ICU, Pain in heamatology. Pain in children. Pain at the end of life. Advances in Radiotherapy and chemotherapy management of pain. Headache syndrome.

Clinical course

Candidate should attend, 5 Cancer pain clinic 5 Myoskeletal pain clinic, 5 intervention pain techniques ,Candidate should provide at least 2 presentations during the course.

1716706 Physiology of pain	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

- Definition of pain, membrane, potentials and synapses..
- Nociceptors.
- Neural pathway:fast and slow fibers.
- Neurotransmitters:excitatory and inhibitory
- Pain processing and transmission in spinal cord.
- Pain processing in the brain
- Pain processing at cellular levels.
- Mopdulation(descending inhibition)
- Peripheral sensitization
- Central sensitization

1716704 Pharmacology of pain	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

- Mechanism of action of anaigesic drugs
- Pharmaco kinetics and pharmaco dynamics
- Local anaesthetics
- NSAID., OPIDS
- Neuroleptics corticosteroids
- Other anagesics
- Drugs interaction

1716801 Anatomy of pain	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

It deais with the recent knowledge in human anatomy to learn and understand management of pain anatomical approach to head and neck block, anatomical approach to sympathetic ganglion block neuroaxial block, regional block to upper and lower limb regional block to thorax abdomen and pelvis.

1716802 Physiology of pain	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

- Receptors,new channels of cell membrane,blood bain barrier,CSF and intracranial pressure..
- New theories in pain mechanics, inflammatory mediators of pain,nociceptors,sensitization
- ,transduction and transmission.
- Heart: heart muscle, heart as a pump, rhythmic excitation of the heart, circulation, cardiac output ,venous return an d their regulation.
- Pulmonary ventilation, pulmonary circulation, gas exchange. Regulation of respiration, respiratory insufficiency.
- Practical: Osmotic fragility, membrane extraction. ECG. Pulmonary function, ventilation. Lipid peroxidation in erythrocytes. Na,K ATPase determination.

1716803 Pharmacology **of pain**

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	2

- Recent advances in mechanism of action of analgesics,pharmacokintecis and pharmacodynamics.,and drug interaction..
- Local anaestetics
- NSAIDS
- Opioids
- NMDA antagonists.
- Antidepressants
- Anticonvulsants
- Neuroleptics.
- Corticosteroids.

1716807 Acute pain

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	**6**	**4**

Acute pain : Anesthesiology for the Non-Anesthesiologist, assessment of acute pain in adult, assessment of acute pain in children and neonates, pathophysiology and management of acute pain, acute pain team, Quality assurance in acute pain, Mishaps in acute pain, Multimodal approach for pain management, trauma, Acute abdomem.

1716808 Chronic pain

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	**4**	**4**

Addiction ,Rheumatology, Back and neck pain, Complex regional pain syndrome (CRPS), Fibromyalgia, Headache, Neuropathic pain, Orofacial pain, Pelvic pain

1716809 Palliative care

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	**4**	**3**

Pain and Symptom Control; Psychosocial Care; Understanding the Evidence: Ethics,HIV and Aids,End-Stage Cardiac,End Stage Respiratory,End Stage Neurological and End Stage Renal Disease.Communication Skills.Oncology and Haematology. Advanced Practice.

1716820 Infection control

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

- Nosocomial infection,
- Antibiotic resistance,
- Antiseptics, and
- Disinfection procesdures.

1716870 Psychological and Neuological Principles

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

- Emotions: Definition And Mechanisms
- Emotion And Cognition
- Stress, Sickness, And Pain
- Pain And Learning
- Psychiatric Illness, Depression, Anxiety, And Somatoform Pain Disorders
- The Psychology Of Addiction
- The Doctor-Patient Relationship In Pain Management Dealing With Difficult Clinician-Patient Interactions
- **Class Activity**
- Dealing With Difficult Clinician-Patient Interactions
- How To Deal With Major Anxiety Disorder
- How To Deal With Major Depressive Disorder
- How To Deal With Panic Attack
- Cognitive-Behavorial Therapy
- Meditation , Relaxation Sessions
- Psychodynamic Psychotherapy

1716620 Infection control

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

1-Importance of infection control in the health care setting; introduction
2-Nosocomial infection:Definition ,methods of acquiring infection, and prevention.
3-Prevntion of occupational transmission of infection
-Aseptic technique- IV therapy ,injection safety and proper use of multi-dose vials.- Hand hygiene.
-Personal protective equipment Gloves- Aprons- Head gear- Face ,eye and respirator protection- Overshoes and foot wear
-sharp injury prevention
4- Prevention and control of antimicrobial resistant organism: Antibiotic usage - Formulating antibiotic policy.
5-Environmental cleaning Cleaning and sterilization of medical equipment

1716720 Infection control

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

1-Importance of infection control in the health care setting;
Introduction
2-Nosocomial infection:
Definition, methods of acquiring infection, and prevention.
3-Prevntion of occupational transmission of infection
-Aseptic technique
-IV therapy ,injection safety and proper use of multi-dose vials.
-Hand hygiene.
Microbial flora of skin
Types of hand hygiene.
Antiseptic hand wash or alcohol based hand rub
-Personal protective equipment
Gloves, Aprons, Head gear, Face ,eye and respirator protection, Overshoes and foot wear
-sharp injury prevention
4- Prevention and control of antimicrobial resistant organism
- Antibiotic usag, Formulating antibiotic policy.
5-Environmental cleaning
Cleaning and sterilization of medical equipment

1716770 Psychological and Neuological Principles

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

- Emotions: Basic Definition And Mechanisms
- Basic Principle In Emotion And Cognition
- Stress, Sickness, And Pain
- Pain And Learning (Basic Principle)
- Psychiatric Illness, Depression, Anxiety, And Somatoform Pain Disorders (Basic Principle**)**
- The Psychology Of Addiction
- Dealing With Difficult Clinician-Patient Interactions

Class Activity

- How To Deal With Major Anxiety Disorder
- How To Deal With Major Depressive Disorder
- How To Deal With Panic Attack
- Meditation
- Relaxation Sessions
- Psychodynamic Psychotherapy

Master Degree in Chemical Pathology

1717700 - Department of Chemical Pathology

Admission Requirements: Graduate students with a M.B.Ch.B of Medicine, B.Sc. of Pharmacy

Core **Courses (22Cr):** 1717701, 1717702, 1717703, 1717704, 1717705, 1717706(A), 1717706(B) , 1717707, 1717708, 1717709

Elective Courses (8 Cr): 1701720, 1721720, 1703720, 1705720, 1706720., 1707720, 1713720, 1701721, 1715720

M.Sc Thesis: 8 **Cr**

Core Courses (22 Cr)

Code	Name	Hours/Week		
		Theoretical	Practical	Total Cr
1717701	Basic Principles in Chemical Pathology	1	2	2
1717702	Techniques & Instruments in Chemical Pathology	1	2	2
1717703	Separation Techniques	1	2	2
1717704	Renal Functions	1	2	2
1717705	Body Ions, Water, Blood Gas & Acid-Base Balance	2	2	3
1717706 (A)	Main Body Components (A)	2	2	3
1717706 (B)	Main Body Components (B)	1	2	2
1717707	Hepatic & Gastrointestinal Functions	1	2	2
1717708	Endocrine Organs	1	2	2
1717709	Cardiac, Bone, Malignancy, Malnutrition, Maternal & Fetal Health and Other Body Fluids	1	2	2
		12	**20**	**22**
Elective Courses (8 Cr)				
1701720	Biochemistry	1	2	2
1721720	Medical Statistics	1	2	2
1703720	Physiology	1	2	2
1705720	Haematology	1	2	2
1706720	Bacteriology	1	2	2
1707720	Parasitology	1	2	2
1713720	Human Genetics	1	2	2
1701721	Molecular Biology	1	2	2
1715720	Internal Medicine	1	2	2

Medical Doctor In Chemical Pathology

1717800 - Department of Chemical Pathology

Admission Requirements: Postgraduate students with a M.Sc. or an equivalent degree in Chemical Pathology.

Core Courses (18 Cr): 1717801, 1717802, 1717803, 1717804, 1717805, 1717806, 1717807, 1717808.

Elective Courses (6 Cr):1701823, 1703820, 1713820, 1715820, 1707820, 1708820, 1721820, 1710820, 1706820, 1701820, 1705820.

M.D. Thesis: 24 **Cr**.

Core Courses (18 Cr)

Code	Name	Hours/Week		
		Theoretical	Practical	Total Cr
1717801	Laboratory & Quality Management	1	2	2
1717802	Laboratory Methods & Applications in Chemical Pathology	2	2	3
1717803	Laboratory Assessment of Acquired Disturbed Metabolism	2	2	3
1717804	Assessment of Organ Dysfunction by Lab Means	2	2	3
1717805	Diagnosis & Monitoring of Diseases by Lab Means	2	2	3
1717806	Lab Evaluation of Hypothalamic-Pituitary- End-organ Axes	1	2	2
1717807	Evaluation of Inborn Error of Metabolism by Lab Means	1	--	1
1717808	Recent Advances in Chemical Pathology	1	--	1
		12	**12**	**18**
Elective Courses (6 Cr)				
1701823	Molecular Biology	2	2	3
1703820	Physiology	2	2	3
1713820	Human Genetics	2	2	3
1715820	Internal Medicine	2	2	3
1707820	Parasitology	2	2	3
1708820	Immunology	2	2	3
1721820	Medical Statistics	2	2	3
1710820	Pathology	2	2	3
1706820	Bacteriology	2	2	3
1701820	Biochemistry	2	2	3
1705820	Haematology	2	2	3

Course Description of the courses offered by Chemical Pathology Department

1717701 Basic Principles in Chemical Pathology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Patient preparation, specimen collection, identification, handling, transport, and storage.
- Preparation, adjustment and storage of reagents, buffers, and standards, Methods of standardization and calibration.
- Quality assessment and controls (internal and external).
- Pre-analytical and analytical variance.
- Laboratory performance and their assessment.
- Laboratory safety.
- Point of care testing (near-patient).
- Clinical interpretation of lab data.

1717702 Techniques & Instruments in Chemical Pathology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Spectrophotometric techniques.
- Light scattering techniques and fluorometry.
- Electrochemical methods.
- lmmunochemical methods.
- Osmometry.
- Radioactivity and its counting.
- Automated and semi-automated analyzers.
- Flame photometer and blood gas analyzer.

1717703 Separation Techniques

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Centrifugation and ultracentrifugation.
- Chromatographic separation.
- Electrophoretic separation .
- DNA and RNA separation and analysis.
- Flowcytometry and cell counter.

1717704 Renal Functions

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Complete urine analysis.
- Renal function tests.
- Non-protein nitrogenous compounds.
- Urinary stones.

1717705 Body Ions, Water, Blood Gas & Acid-Base Balance

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Na^{+}, K^{+}, Cl', $HC0_3^{-}$.
- Body water.
- Osmolality and osmolarity of plasma and urine.
- Arterial blood gases, Acid base balance (regulation - disturbances).
- Ca^{2+}, $P0_4^{-3}$, Mg^{2+}.
- Iron and copper metabolism.
- Porphyria.
- Trace elements (essential- non essential- toxic)

1717706 (a) Main Body Components (A)	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Carbohydrates
- Proteins (plasma and other body fluids).
- Amino acids
- Enzymes

1717706(b) Main Body Components (B)	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Lipids and lipoproteins.
- Vitamins.
- Cytokines
- Growth factors.

1717707 Hepatic & Gastrointestinal Functions	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Hepatobiliary functions.
- Gastric functions.
- Intestinal functions.
- Pancreatic functions.
- Gall bladder stones.
- Occult blood and fecal fat analyses.

1717708 Endocrine Organs	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Hormone structures, mechanisms of actions and their receptors.
- Anterior and posterior pituitary function and dysfunction.
- Thyroid function and dysfunction.
- Parathyroid function and dysfunction.
- Adrenal functions (cortex and medulla) and dysfunctions.
- Reproductive organs functions (male and female) and dysfunctions.

1717709 Cardiac, Bone, Malignancy, Malnutrition, Maternal & Fetal Health and Other Body Fluids	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Cardiac markers (proteins and enzymes).
- Bone remodeling.
- Tumor markers.
- Nutritional assessment by laboratory means.
- Assessment of maternal and fetal health.
- Lab evaluation of the following serous fluids: seminal, CSF, ascetic, pleural, pericardial, and synovial fluids.
- Biochemical aspects of hematology.
- Therapeutic drug monitoring.

1717801 Laboratory and quality management	**Hour/ week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Lab and Quality management and communication skills.
- Lab variance, their control and selection and evaluation of a method.
- Diagnostic performance, selection, and interpretation of a test.
- Role of statistics in clinical laboratory work.
- Establishment and use of reference values.
- Water quality used in the lab (requirements, purification and methods of checking).
- Reagents, reference materials and procedures for concentration and standardization of solutions.
- Units of measurements (SI and conversion rules).

1717802 Laboratory methods and applications in chemical pathology	**Hour/week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Methods for separation (filtration, dialysis, centrifugation and ultracentrifugation, chromatography, electrophoresis).
- Spectrophotometry , Luminescence techniques, Immunochemical and Electrochemical methods
- Mass spectrometry.
- Radioactivity and its measurement.
- Automation in the clinical lab and dry chemistry.
- Bioassay and biosensors and Continuous flow techniques (flow through spectrophotometers, cell counters, and flowcytometry).
- Point of care (near patient) testing

1717803 Laboratory assessment of acquired disturbed metabolism	**Hour/ week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Disorders of carbohydrate metabolism.
- Dyslipidemia.
- Abnormal proteins in plasma (quality, quantity, and not normally present), urine, CSF, and other body fluids.
- Water and electrolyte imbalance (dehydration, overhydration, DI, hypo/hypernatremia, hypo/hyperkalemia, hypo/hypercalcemia, hypo/hyperphosphatemia) and acid base disturbances
- Disorders of iron and copper metabolism. - Disorders of amino acid metabolism.
- Disturbances in plasma enzyme activities. -Disturbances in plasma vitamins levels.
- Therapeutic drug monitoring, drug toxicity and drug abuse.
- Stone formation (urinary, biliary, salivary, pancreatic, prostatic).

1717804 Assessment of organ dysfunction by lab means	**Hour/ week**		**Total Cr**
	Theoretical	**Practical**	
	2	2	3

- Hepatic cell injury and cholestasis.
- Renal glomerular and tubular defects and monitoring of renal replacement therapy.
- Coronary insufficiency.
- Endothelial cell dysfunction.
- Abnormal bone remodeling and metabolic bone diseases.
- Gastrointestinal disorders.
- Disorders of pancreas (exocrine and endocrine).
- Assessments of maternal (pregnancy) and fetal health.

1717805 Diagnosis and monitoring of diseases by lab means	**Hour/ week**		**Total Cr**
	Theoretical	**Practical**	
	2	2	3

- Tumour, Hepatitis, Cardiac, Inflammatory, Malnutrition and Autoimmune Markers
- Insulin antagonists (drugs, counter insulin hormones, and antibodies).
- Uncontrolled diabetes mellitus.
- Musculoskeletal disorders.
- Lab aspects of hypertension and atherosclerosis.
- Assessment of porphyrin disorders (porphyria).
- Lab aspects of organ transplantation.
- Lysosomal storage disease.

1717806 Lab evaluation of hypothalamic-pituitary-end-organ axes	**Hour/week**		**Total Cr**
	Theoretical	**Practical**	
	1	2	2

- Hypothalamic-pituitary-thyroid axis.
- Hypothalamic-pituitary-adrenocortical axis.
- Hypothalamic-pituitary-gonadal axis (male and female).
- Hypothalamic-posterior pituitary axis. (anti-diuretic hormones and oxytocin).

1717807 Evaluation of inborn errors of metabolism by lab means	**Hour/ week**		**Total Cr**
	Theoretical	**Practical**	
	1	--	1

- Inborn errors of carbohydrate metabolism (galactose, fructose, pentose, and glycogen storage diseases).
- Inborn error of lipid and lipoprotein metabolism (familial LDL receptor defect).
- -Inborn errors of amino acids metabolism (aminoaciduria and urea cycle defects).
- Inborn errors of bilirubin metabolism.
- Inborn errors of membrane conductivity (cystic fibrosis).
- Inborn errors of mucopolysaccharides metabolism (Hunter syndrome).
- Gangliosidosis.

1717808 Recent advances in chemical pathology	**Hour /week**		**Total Cr**
	Theoretical	**Practical**	
	1	--	1

- Chemico_pathological aspects of extreme age- related disturbances.
  - In geriatrics: theories of aging, biochemical and physiologic changes of aging, osteoporosis, preanalytical variables in elderly, therapeutic drug monitoring in elderly, biochemical tests used for screening for diseases in elderly and alzheimer's disease.
  - In pediatrics: some pediatric reference intervals, intrauterine growth retardation, assessment of fetal lung maturity, diagnosis of premature lung maturity, neonatal jaundice, screening for neonatal diseases, material screening for fetal defects and postnatal newborn screening.
- Laboratory evaluation of human cell disorders:
  Cell composition, signaling, metabolism, regulation, proteins, apoptosis and cancer development.
- Biomarkers in genomics, proteomics, glycomics, lipidomics and metalolomics.

1717720 Chemical pathology	**Hour/Week**		**Total Cr**
	Theoretical	**Practical**	
	1	2	2

- Basic lab units & calculations
- Lab safety
- Sampling
- Role of lab in DM
- Lipid profile
- Enzymes
- Liver function tests (1)
- Liver function tests (2)
- Basic screening tests for kidney function (1)
- Basic screening tests for kidney function (2)
- Electrolyte imbalance

1717820 Chemical Pathology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Sampling techniques
- Lab units and calculations
- Laboratory safety
- Basics in lab quality
- Disorders of carbohydrates metabolism
- Lipid profile
- Disorders of liver function
- Assesment of kidney function
- Cardiac markers
- Tumor markers
- Point of care (near patient) testing

Master Degree in Biomedical Devices

1720700 - Department of Biomedical Engineering

Admission Requirements: Graduate students with a B.Sc. of Engineering or its equivalent.
Core Courses (21 **Cr**): 1720701, 1720702, 1720703, 1720704, 1720705, 1720706, 1720712

Elective Courses (9 Cr): 1720707, 1720708, 1720709, 1720710, 1720711, 1720713 ,1720714,
1720717, 1720718

M.Sc. Thesis: 8 Cr.

Code	Name	Hourse/ Week		
		Theoretical	**Practical**	**Total Cr**
1720701	Introduction to Biomedical Engineering	3	2	4
1720702	Bioelectric Phenomena	2	2	3
1720703	Biomedical Sensors	2	2	3
1720704	Biomedical Signal Analysis	2	2	3
1720705	Diagnostic Imaging	2	2	3
1720706	Medical Instruments and Devices	2	2	3
1720712	Technical Report Writing and Presentation Skills	2	-	2
		15	**12**	**21**
Elective Courses (9 Cr)				
1720707	Prosthesis and Artifical Organs	2	2	3
1720708	Physiological Modeling, Simulation and Control	2	2	3
1720709	Clinical Neurophysiology	2	2	3
1720710	Intensive Care Engineering	2	2	3
1720711	Medical Informatics	2	2	3
1720713	Ethical Issues Associated with the use of Medical Technology	2	2	3
1720714	Design of Experiments	2	2	3
1720717	Security Systems	2	2	3
1720718	Artificial Intelligence and Machine Learning	2	2	3

Master Degree in Biomedical Image Processing

1720700 - Department of Biomedical Engineering

Admission Requirements: Graduate students with a B.Sc. of Engineering or its equivalent.

Core Courses (21 Cr): 1720701, 1720704, 1720705, 1720711, 1720712, 1720715, 1720716.

Elective Courses (9 Cr): 1720702, 1720703, 1720708, 1720713, 1720714, 1720717 ,1720718.

M.Sc. Thesis: (8 Cr)

Core Courses (21 Cr)

Code	Name	Hourse/ Week			Prerequisite Courses
		Theoretical	Practical	Total Cr	
1720701	Introduction to Biomedical Engineering	3	2	4	
1720704	Biomedical Signal Analysis	2	2	3	
1720705	Diagnostic Imaging	2	2	3	
1720711	Medical Informatics	2	2	3	
1720712	Technical Report Writing and Presentation Skills	2	-	2	
1720715	Introduction to Digital Image Processing	2	2	3	
1720716	Advanced Topics in Digital Image Processing	2	2	3	
		15	12	21	
Elective Courses (9 Credit Hours)					
1720702	Bioelectric Phenomena	2	2	3	
1720703	Biomedical Sensors	2	2	3	1720702
1720708	Physiological Modeling, Simulation and Control	2	2	3	1720702
1720713	Ethical Issues Associated with the use of Medical Technology	2	2	3	
1720714	Design of Experiments	2	2	3	
1720717	Security Systems	2	2	3	
1720718	Artificial Intelligence and Machine Learning	2	2	3	

Description of the courses offered by Biomedical Engineering Department

1720701 Introduction to Biomedical Engineering

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

Tissue Terminology, Terminology of General Anatomy, Locomotive System, Digestive System, Respiratory System, Circulatory System, Excretory System, Endocrine System, Nervous System, Regulatory Functions 1, Regulatory Functions 2, Sensory Organs

1720702 Bioelectric Phenomena

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Overview of the cell membrane structure, Overview of transport through Membrane
- Overview of the membrane potential, Overview of the action potential
- Molecular basis of skeletal muscle contraction
- Motor End plate(MEp)
- Smooth muscle. Structure, contraction and MEp
- Cardiac muscle, Structure, contraction and MEp
- Cell transformation of non pacemaker into pacemaker
- Principle of electromyogram, electrocardiogram and electroencephalography

1720703 Biomedical sensors

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Physical Measurements
- Biopotential Electrodes
- Electrochemical Sensors
- Optical Sensors
- Bioanalytic Sensors

1720704 Biomedical Signal Analysis

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Biomedical Engineering Signal Analysis, System Classification, Classification of Signals, Basis Functions and Signal Representation, Data Acquisition Process, Sampling Theory and Analog-to-Digital Conversion, Digital Filters, Fourier Series: Trigonometric, Fast Fourier Transform, Spectral Analysis, Window Functions and Spectral Leakage

1720705 Diagnostic Imaging

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-X-Ray
-Computed Tomography
-Magnetic Resonance Imaging
-Nuclear Medicine, Ultrasound
-Magnetic Resonance Microscopy
-Positron-Emission Tomography (PET)
-Electrical Impedance Tomography
-Medical Applications of Virtual Reality Technology

1720706 Medical Instruments and Devices

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Biopotential Amplifiers, Noninvasive Arterial Blood Pressure and Mechanics, Cardiac Output Measurement, Bioelectric Impedance Measurements, Respiration, Clinical Laboratory: Separation and Spectral Methods, Clinical Laboratory: Nonspectral Methods and Automation, Implantable Cardiac Pacemakers, Implantable Stimulators for Neuromuscular Control, External Defibrillators, Implantable Defibrillators, Electrosurgical Devices, Mechanical Ventilation, Parenteral Infusion Devices, Essentials of Anesthesia Delivery, Biomedical Lasers, Noninvasive Optical Monitoring, Medical Instruments and Devices Used in the Home, Virtual Instrumentation, Sensors in biomedical measurements

1720707 Prosthesis and Artificial Organs

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Artificial Heart and Circulatory Assist Devices, Cardiac Valve Prostheses, Vascular Grafts, Artificial Lungs and Blood-Gas Exchange Devices, Artificial Kidney, Peritoneal Dialysis Equipment, Therapeutic Apheresis and Blood Fractionation , Liver Support Systems, Artificial Pancreas, Nerve Guidance Channels, Tracheal, Laryngeal, and Esophageal Replacement Devices, Artificial Blood, Artificial Skin and Dermal Equivalents

1720708 Physiological Modeling, simulation and control

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-Modeling Strategies in Physiology
-Compartmental Models of Physiologic Systems
-Cardiovascular Models and Control
-Respiratory Models and Control
-Neural Networks for Physiological Control
-Methods and Tools for Identification of Physiologic Systems
-Autoregulating Windkessel Dynamics May Cause Low Frequency Oscillations
-Control of Movements
-The Fast Eye Movement Control System

1720709 Clinical Neurophysiology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-The central nervous system – EEG:
Recording techniques, Wave types, Provocation of EEG, Clinical use of EEG, Automatic signal analysis of EEG
Peripheral nerves and muscles:
Electromyography, Conduction velocities in motor nerves, Electroneurography
Neurophysiological measurement technique

1720710 IntensiveCare Engineering

Hour/Week		
Theoretica	**Practical**	**Total Cr**
2	2	3

- **Respiration**
- Artificial ventilation and free airway, Ventilators , Hyperbaric treatment with oxygen
- **Circulation**
- cardiac arrest, shock, myocardial infarction, extracorporeal circulation and assisted circulation
- **Internal environment and nutrition**
- Nutrition, Fluid balance, Electrolyte balance, Acid-base balance, Dialysis, Parameters in intensive monitoring, Automatic data analysis in intensive care unit

1720711 Medical Informatics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Hospital Information Systems: Their Function and State
- Computer-Based Patient Records
- Computer Networks in Health Care
- Overview of Standards Related to the Emerging Health Care Information Infrastructure
- Non-AI Decision Making
- Design Issues in Developing Clinical Decision Support and Monitoring Systems

1720712 Technical Report Writing and Presentation Skills	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

- Introduction to scientific writing
- Title &abstract
- Literature review
- Research methods
- Discussion &conclusion
- References &publication

1720713 Ethical Issues Associated with the use of Medical Technology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Professional Ethics in Biomedical Engineering
-Beneficence, Nonmaleficence, and Technological Progress
-Ethical Issues of Animal and Human Experimentation in the Development of Medical Devices
-Regulation of Medical Device Innovation

1720714 Design of Experiments	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Observational design
-Experimental design
-Sources of error
-Designing questionnaire

1720715 Introduction to Digital Image Processing	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

1. **Introduction :** What Is Digital Image Processing?, Fundamental Steps in Digital Image Processing
2. **Digital Image Fundamentals:** Elements of Visual Perception, Image Sensing and Acquisition, An Introduction to the Mathematical Tools Used in Digital Image Processing
3. Intensity Transformations and Spatial Filtering: Some Basic Intensity Transformations Functions , Histogram Processing, Fundamentals of Spatial Filtering , Smoothing Spatial Filters
4. **Filtering In The Frequency Domain:** Preliminary Concepts, Sampling and the Fourier Transform of Sampled Functions, The Basics of Filtering in the Frequency Domain, Image Smoothing using Frequency-Domain Filters , Image Sharpening using Frequency-Domain Filters

1720716 Advanced Topics in Digital Image Processing	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

1- Wavelets and Multiresolution Processing: Image Pyramids , Subband Coding , The Haar Transform , Multiresolution Expansions , Wavelet Transforms in One Dimension , The Fast Wavelet Transform , Wavelet Transforms in Two Dimensions , Wavelet Packets

2- Image Compression : Fundamentals , Coding Redundancy, Image Compression Models, Elements of Information Theory , Error-Free Compression , Lossy Compression , Image Compression Standards

3- Image Segmentation : Fundamentals, Point, Line, Edge Detection, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds , The Use of Motion in Segmentation

4- Object Recognition: Patterns and Pattern Classes , Recognition Based on Decision-Theoretic Methods , Structural Methods

1720717 Security Systems	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Techniques for achieving security in multi-user computer systems and distributed computer systems, Cryptography: secret-key, public-key, digital signatures, Authentication and identification schemes, Intrusion detection: viruses, Formal models of computer security, Secure operating systems, Software protection, Firewalls, Risk assessment.

1720718 Artificial Intelligence and Machine Learning	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Intelligence; cognitive versus artificiel definitions
-Knowledge versus information
-Logic: Propositional and Predicate calculus
-Semantic Nets
-Production rules
-Scripts and Frames
-Search Techniques: Blind versus directed searches
-Introduction to inductive machine learning

Diploma Degree in Biomedical informatics and Medical Statistics

1721600 - Department of Biomedical informatics and Medical Statistics

Admission Requirements: Graduate students with a M.B.CH.B of Medicine, dentistry, B.Sc Pharmacy, Veterinary, Physiotherapy, Nursing

Core Courses (20 Cr): 1721601,1721602, 1721603, 1721604, 1721605, 1721606

Elective Courses (10 Cr): 1721607,1721608, 1721609,1721610,1721611,1721612,1721613, 1721614

Core Courses (20 Credit Hours)

Code	Name	Hour/Week		
		Theoretical	Practical	Total Cr
1721601	Introduction to Personal Computers and the Internet	2	2	3
1721602	Principles of Registration of Chronic Diseases	2	2	3
1721603	Principles of Medical Statistics	2	4	4
1721604	Principles of Medical Research Designs	2	2	3
1721605	Intermediate Medical Statistics	2	4	4
1721606	Regression Analysis	2	2	3
		12	**16**	**20**
Elective Courses (10 Credit Hours)				
1721607	Ethics in Research and in the Internet	2	2	3
1721608	Introduction to Bioinformatics	1	2	2
1721609	Scientific Writing	2	2	3
1721610	Basic Epidemiology	2	2	3
1721611	Basic pharmaco-epidemiology	2	2	3
1721612	Hospital statistics	2	2	3
1721613	Introduction to Evidence Based Medicine	1	2	2
1721614	Basic genetic epidemiology	2	2	3

Master Degree in Biomedical Informatics and Medical Statistics

1721700 - Department of Biomedical informatics and Medical Statistics

Admission Requirements: Graduate students with a M.B.CH.B. of Medicine, dentistry, B.Sc. Pharmacy, Veterinary, Physiotherapy, Nursing

Core Courses (20 Cr): 1721701, 1721702, 1721703, 1721704, 1721705, 1721706

Elective Courses (10 Cr): 1721707, 1721708, 1721709, 1721710, 1721711, 1721712, 1721713, 1721614

M.Sc. Thesis: (8 Cr)

Core Courses (20 Cr)

Code	Name	Hour/Week		
		Theoretical	Practical	Total Cr
1721701	Principles of Medical Statistics	2	4	4
1721702	Principles of Medical Research Designs	2	2	3
1721703	Intermediate Medical Statistics	2	4	4
1721704	Regression Analysis	2	2	3
1720705	Introduction to Personal Computers and the Internet	2	2	3
1721706	Scientific Writing	2	2	3
		12	**16**	**20**
Elective Courses (10 Credit Hours)				
1721707	Ethics in Research and Internet	1	2	2
1721708	Hospital statistics	2	2	3
1721709	Introduction to Evidence Based Medicine	1	2	2
1721710	Bioinformatics	2	2	3
1721711	Basic genetic epidemiology	2	2	3
1721712	Basic pharmaco-epidemiology	2	2	3
1721713	Basic Epidemiology	2	2	3
1721714	Principles of Registration of chronic diseases	2	2	3

Doctor of Philosophy in Biomedical Informatics and Medical Statistics

1721800 - Department of Biomedical informatics and Medical Statistics

Admission Requirements: Postgraduate students with M.Sc. or an equivalent degree in Medical Informatics.

Core Courses (14 Cr): 1721801, 1721802, 1721803, 1721804,

Elective Courses (10 Cr): 1721805 1721806, 1721807, 1721808, 1721809, 1721810, 1721811, 1721812, 1721813, 1721814, 1721815, 1721816, 1721818, 1721817, 1721819

Ph.D. Thesis: 24 Cr

Core Courses (14 Cr)

Code	Name	Credit Hours		
		Theoretical	Practical	Total Cr
1721801	Time series analysis	2	2	3
1721802	Systematic Review and Meta-analysis	2	4	4
1721803	Clinical Measurements and Accuracy of Diagnostic Tests	2	2	3
1721804	Advanced Topics in Registration of chronic diseases	2	4	4
		8	**12**	**14**
Elective Courses (10 Cr)				
1721805	Basic genetic epidemiology	3	--	3
1721806	Advanced Genetic epidemiology	2	--	2
1721807	Critical Appraisal &Journal club	1	4	3
1721808	Principles of Registration of Chronic Diseases	2	2	2
1721809	GIS and Open Source Systems	2	2	3
1721810	Survival Analysis	1	2	2
1721811	Statistical tools in quality of healthcare	2	2	3
1721812	Evidence Based Medicine	2	-	2
1721813	Advanced Bioinformatics	3	2	4
1721814	Artificial Intelligence	2	2	3
1721815	Data reduction, classification and scale reliability	2	2	3
1721816	Evidence based guidelines	3	-	3
1721817	Regression Analysis	2	2	3
1721818	Economics of Health& Medical care	1	2	2
1721819	Intermediate Medical Statistics	2	2	3

1721601 Introduction to Personal Computers and the Interr

Theoretical	Practical	Total Cr
2	2	3

PC - Windows and Application Programs:

Introduction to Microsoft Windows, Windows Applications, Word Processing with Microsoft Word, Working with Spreadsheets - Microsoft Excel, Creating Slide Presentations - Microsoft Powe Point, Working with Databases - Microsoft Access, Creating Graphic Animations.

Internet Applications:

Connecting to Remote Computers with Telnet and SSH, Transferring Files on the Internet with FTP, News Groups and News Readers.

1721602 Principles of Registration of Chronic Diseases

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-Introduction,
-Purpose and uses of reporting,
-Data sources and reporting,
-Classification and coding
-Using ICD 10

1721603 Principles of Medical Statistics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

-Sources of data
- Types of data
-Graphical presentation of data
- Mathematical presentation of data, Shape of distribution
- Tests of significance: t test and x2 test
-Checking for data

1721604 Principles of Medical Research Designs

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

This course will discuss different types of research methods:
-Observational designs
- Experimental designs, Sources of error
- Collection of data
-Designing a questionnaire.
-Clinical trial

1721605 Intermediate Medical Statistics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

-Comparisons of means,
-Factorial ANOVA,
-Repeated-Measures designs
-Non parametric statistics
-Kappa test
-Mcnemar test

1721606 Regression Analysis

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Topics include probability theory, Discrete and continuous variables, Hypothesis testing, Linear regression.
- Regression assumptions
- Multiple regression
- Logistic regression
- Multicolinearity

1721607 Ethics in Research and in the Internet

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- The concepts of ethics and moral behavior
- Ethical issues surrounding e-health, health research, Spam, Intellectual property.
- Pirating and plagiarism, Budgetary and financial issues
- Team building and leadership, Legal issues
- Marketing and communications.

1721608 Introduction to Bioinformatics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

- Analysis of individual sequences
- Genetic analysis: SNP, Mutation, Sequencing
- Expression Analysis: mRNA, Protein
- Interaction Analysis: Protein-Protein, Antigen-Antibody, Enzyme-Substrate, Protein-DNA, Ligand-Receptor
- Proteomics : Introduction , b- Different Levels of Protein Structure, c-Prediction Methods
- Molecular Biology techniques
- Bioinformaticstoolbox:Analyze genomic, proteomic, & microarray data

1721609 Scientific Writing

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Introducing scientific writing
- Title, abstract, key words
- Literature review
- Subjects and methods
- Presenting the results
- Discussions and conclusions
- References, Publication ethics

1721610 Basic epidemiology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- The course will cover:
- History of Epidemiology, What is Epidemiology
- Components of Epidemiology, Purposes Of Epidemiology
- Two Broad Types of Epidemiology
- The Basic Triad Of Descriptive Epidemiology
- Analytic Epidemiology
- Natural history of disease
- Levels of prevention

1721611 Basic pharmacoepidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- The course will cover:
- Introduction to pharmacoepidemiology
- Basic statistical tools in pharmacoepidemiology
- Clinical trials
- The main methodological issues raised by pharmacoepidemiological studies

1721612 Hospital statistics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Hospital rates
- Bed turnover
- Bed occupancy
- Nosocomial infection

1721613 Introduction to Evidence Based Medicine	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Formulating health questions, Netting the evidence,
- Critical appraisal of case-control studies, Critical appraisal of cohort studies
- Critical appraisal of diagnostic studies
- Critical appraisal of randomized controlled trials,
- Critical appraisal of systematic reviews and meta-analyses

1721614 Basic Genetic epidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Introduction to genetic epidemiology
- Hardy-weinberg equilibrium, Estimation of gene frequencies
- Estimation of factors affecting the genetic str. of population
- Segregation analysis
- Multifactorial inheritance
- Estimation of recurrence risk for genetic counseling(Mendelian inheritance)
- Parental age and birth order
- Recognition and estimation of changes in disease frequencies

1721701 Principles of Medical Statistics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

- Sources of data
- Types of data
- Graphical presentation of data
- Mathematical presentation of data
- Shape of distribution
- Tests of significance: t test and x2 test

1721702 Principles of Medical Research Designs	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

This course will discuss different types of research methods:

- Observational designs
- Experimental designs
- Cross sectional study
- Case control study
- Cohort study
- Clinical trials
- Systematic review& meta analysis

1721703 Intermediate Medical Statistics	**Hour/Week**		
	Theoretical	Practical	Total Cr
	2	4	4

- Comparisons of means,
- Factorial ANOVA
- Repeated-Measures designs
- Non parometric statistics
- MC nomor test
- Kappa test

1721704 Regression Analysis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Topics include probability theory, Discrete and continuous variables, Hypothesis testing, Linear regression.
- Multiple regression
- Logistic regression.
- Regression assumptions
- Multicolinearity

1721705 Introduction to Personal Computers and the Internet	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

PC - Windows and Application Programs:

Introduction to Microsoft Windows, Windows Applications, Word Processing with Microsoft Word, Working with Spreadsheets - Microsoft Excel, Creating Slide Presentations - Microsoft PowerPoint, Working with Databases - Microsoft Access, Creating Graphic Animations.

Internet Applications:

Connecting to Remote Computers with Telnet and SSH, Transferring Files on the Internet with FTP, News Groups and News Readers.

1721706 Scientific Writing	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Introducing scientific writing
- Title, abstract, key words
- Literature review
- Subjects and methods, presenting the results
- Discussions and conclusions
- References, Publication ethicsThis.

1721707 Ethics in Research and in the Internet	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- The concepts of ethics and moral behavior
- Ethical issues surrounding e-health, health research
- Spam, Intellectual property.
- Pirating and plagiarism, Budgetary and financial issues, Team building and leadership, Legal issues,
- Marketing and communications.

1721708 Hospital statistics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Hospital rates
- Bed turnover
- Bed occupancy
- Nosocomial infection

1721709 Introduction to Evidence Based Medicine	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- Formulating health questions, Netting the evidence
- Critical appraisal of case-control studies, Critical appraisal of cohort studies
- Critical appraisal of diagnostic studies
- Critical appraisal of randomized controlled trials,
- Critical appraisal of systematic reviews and meta-analyses

1721710 Bioinformatics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

1-Analysis of individual sequences
Genetic analysis: SNP, Mutation, Sequencing

- Expression Analysis: mRNA, Protein
- Interaction Analysis: Protein-Protein, Antigen-Antibody, Enzyme-Substrate, Protein-DNA, Ligand-Receptor

2-Proteomics: a-Introduction , b- Different Levels of Protein Structure , c- Prediction Methods
3-Molecular Biology techniques
4-Bioinformaticstoolbox
5-Microarray data analysis

1721711 Basic Genetic epidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Introduction to genetic epidemiology
-Hardy-weinberg equilibrium, Estimation of gene frequencies
-Estimation of factors affecting the genetic str. of population
-Segregation analysis
-Multifactorial inheritance
-Estimation of recurrence risk for genetic counseling(Mendelian inheritance)
-Parental age and birth order
-Recognition and estimation of changes in disease frequencies

1721712 Basic pharmacoepidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

The course will cover:
-Introduction to pharmacoepidemiology
-Basic statistical tools in pharmacoepidemiology
-Clinical trials
-The main methodological issues raised by pharmacoepidemiological studies.

1721713 Basic epidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

The course will cover:
-*History of Epidemiology*, What is Epidemiology
-Components of Epidemiology, Purposes Of Epidemiology
-Two Broad Types of Epidemiology
-The Basic Triad Of Descriptive Epidemiology
Analytic Epidemiology
-Natural history of disease
-Levels of prevention

1721714 Principles of Registration of Chronic Diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Introduction
-Purpose and uses of reporting
-Data sources and reporting
-Classification and coding
-ICD 10

1721801 Time series analysis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Theory and application of discrete time series models illustrated with forecasting problems.
-Principles of iterative model building.
-Representation of dynamic relations by difference equations.
-Autoregressive integrated Moving Average models.
-Identification, fitting, diagnostic checking of models.
-Seasonal model application to forecasting.

1721802 Systematic Review and Meta-analysis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

-Summary statistics for different types of data
-Assessing and investigating heterogeneity
-Meta analysis of cluster randomized trials.
-Meta analysis of cross over trials
- Meta analysis of non binary data, Investigating bias
-Appropriateness of using “number needed to treat” in systematic reviews.

1721803 Clinical Measurements and Accuracy of Diagnostic Tests	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Assessment of clinical measurement
-Screening of diseases
-Evaluation of diagnostic tests
- ROC curves
-SPC (statistical process control)

1721804 Advanced Topics in Registration of chronic diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

-Review of principles of registration of chronic disease
-Classification and coding of diseases
- Statistical methods of registration.
-Legal aspects and confidentiality for registration
- Quality control.

1721805 Basic genetic epidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	-	3

-Introduction to genetic epidemiology
-Hardy-weinberg equilibrium, Estimation of gene frequencies
-Estimation of factors affecting the genetic str. of population
-Segregation analysis
-Multifactorial inheritance
-Estimation of recurrence risk for genetic counseling(Mendelian inheritance)
-Parental age and birth order
-Recognition and estimation of changes in disease frequencies

1721806 Advanced Genetic epidemiology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	--	2

-Genetic linkage(model based,model free)
-Twin studies
-Case-control association studies
-Family based association studies
-Overview on quantitative genetics
-Issues power in gene analysis
-Estimation of recurrence risk in non Mendelian inheritance
-Overview on mapping strategies quantitative trait mapping

1721807 Critical Appraisal &Journal club	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	4	3

Weekly readings will be selected from contemporary literature in medical informatics. Each student will choose an article once during the quarter, write a summary and questions for discussion with other students

1721808 Principles of Registration of Chronic Diseases	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	2

-Introduction
- Purpose and uses of reporting
- Data sources and reporting
- Classification and coding
-ICD 10

1721809 GIS and Open Source Systems	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Free/open source software, Java, Linux
- Principles of data security-Human organisations and security.
-Specific security systems and issues
- Introduction to GIS
- GIS applications in Africa, Using GIS software.

1721810 Survival Analysis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

-Theory and practice of analytic methods for censored survival data.
-Analysis of two sample survival data
-The General hazards model
Review of current topics in Survival analysis

1721811 Statistical tools in quality of health care

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Students in this course will learn to use and apply the Six Sigma tools to:-
  - Define, processes of health care delivery
  - Improve and control the complex processes of health care delivery

Measurem analyze processes of health care delivery

1721812 Evidence Based Medicine

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	-	2

1. Formulating health questions, Netting the evidence
2. Critical appraisal of case-control studies, Critical appraisal of cohort studies
3. Critical appraisal of diagnostic studies
4. Critical appraisal of randomized controlled trials,
5. Critical appraisal of systematic reviews and meta-analyses

1721813 Bioinformatics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

1-Analysis of individual sequences : •GC content, size, and gene density.

- Genetic analysis: SNP, Mutation, Sequencing
- Expression Analysis: mRNA, Protein
- Interaction Analysis:Protein-Protein, Antigen-Antibody, Enzyme-Substrate,Protein-DNA, Ligand-Receptor

2- Proteomics : Introduction , Different Levels of Protein Structure
3-Molecular Biology techniques
4-Bioinformaticstoolbox
5- Microarray data analysis

1721814 Artificial Intelligence

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-State-space representations, problem reduction, means-end analysis, and-or graphs
- Heuristic searching, depth-first, breadth-first, best-first, hill-climbing, divide and conquer minimax, a-b, Predicate calculus, resolution theorem proving
- Horn clause theorem provers
- AI systems and languages: goals and contexts
-Issues of knowledge representation, Learning and concept formation.

1721815 Data reduction, classification and scale reliability

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-Principal component Analysis
-Factor analysis
-Cluster analysis
-Scale reliability

1721816 Evidence based guidelines

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	-	3

-Evidence based guidelines on the net
-Critical appraisal of guidelines
-Application of guidelines
-Updats in Evidence Based guidelines

1721817 Regression Analysis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Correlation tests
-Assumptions of linear regression
- Sample size calculation in regression
-Linear regression.
-Multiple regression
-Multicolinearity
-Logistic regression

1721818 Economics of Health& Medical care	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

-Total cost of ownership
-Value chain analysis
-Return of investment
-Economics in health care

1721819 Intermediate Medical Statistics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

-Non parametric statistics
-One Way Independent ANOVA
- Analysis of covariance
- Factorial ANOVA
-Repeated-Measures design

1721620 Medical Statistics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

-Sources of data
-Types of data
-Exploration of data(data check, management of missing data)
-Measures of central tendency
-Measures of dispersion
-Graphical presentation of data(for quantitative &qualitative data)
-Shape of distribution, sampling distribution
-Confidence Interval

1721720 Medical Statistics	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

-Types of Varables
- Exploration of data (data check, management of missing data)
-Mathematical presentation of data: Measures of central tendency
-Measures of dispersion
-Graphical presentation of data (for quantitative & qualitative data)
-Shape of distribution, sampling distribution
-Confidence Interval
-Hypothesis testing
-Tests of significance: One sample t test
-In deperdent sample t test

1721721 Computer

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

PC - Windows and Application Programs:
-Introduction to Microsoft Windows, Windows Applications,
-Word Processing with Microsoft Word, Working with Spreadsheets - Microsoft Excel
-Creating Slide Presentations - Microsoft PowerPoint
-Working with Databases - Microsoft Access
-Creating Graphic Animations

1721722 Medical Informatics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-The algorithms of informatics.
-Sequence analysis.
-Molecular modeling.
-Integrated informatics environments.
-Homology modeling.
-Advanced alignment and structural searching.
Docking, and molecular dynamics applied to drug design and the study of biophysical problems (e.g. impact of protein folding on disease states) ranging from small proteins to the study of larger complexes. (e.g. ribosomes).

1721820 Medical statistics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-Tests of significance: Independent sample t test
-Paired t test
-Test of association, Odds ratio, Relative Risk
-Chi Square test
-Correlation (Pearson, Spearman rho correlation test)
-Non parametric statisties: Mann Whitney U test
-Non Parametric statistics : Wilcoxon Signed rank test
-ANOVA (One way independent ANOVA)
-Kruskal Wallis test
-Screening tests
-ROC curve analysis
-Validity and reliability
-Measures of agreement (Kappa test)

1721821 Computer

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

-Word Processing with Microsoft Word, Working with Spreadsheets - Microsoft Excel
-Working with Databases - Microsoft Access
-UNIX and World Wide Web Applications:
-Introduction to e-mail and Text Editors in UNIX
-Working with UNIX basic commands and the File System
-Working with Frame Design on the Web, Creating Image Maps with a Web Page
-Building a Home Page with Microsoft Word

1721822 Medical Statistics

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

-Sources of data
-Types of data
-Exploration of data(data check, management of missing data)
-Mathematical presentation of data: Measures of central tendency
-Measures of dispersion
-Graphical presentation of data(for quantitative &qualitative data)
-Shape of distribution, sampling distribution
-Confidence Interval
-Hypothesis testing
-Tests of significance: One sample t test

1721823 Computer

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

PC - Windows and Application Programs:
-Introduction to Microsoft Windows, Windows Applications,
-Working with Spreadsheets - Microsoft Excel
-Creating Slide Presentations - Microsoft PowerPoint
-Working with Databases - Microsoft Access
-Hypothesis testing
-Tests of significance: One sample t test

Master Degree in Molecular Biomedicine

1722700 - Department of Molecular Biomedicine

Admission Requirements: Graduate students with a M.B.Ch.B. of Medicine, B.Sc. of Science, Agriculture, Pharmacy , Veterinary or equivalent degrees .

Core Courses (24 Cr): 1722701, 1722702, 1709740, 1710722, 1712721, 1719722, 1721722.

Elective Courses (6 Cr):1704722, 1707722, 1708722, 1712722, 1713703, 1721720.

M.Sc. Thesis: (8 Cr)

Core Courses (24 Cr)

Code	Name	Hours / Week		
		Theoretical	Practical	**Total Cr**
1722701	Molecular Biology	3	2	4
1722702	Special Topics in Molecular Biology	4	--	4
1709740	Basics in Laboratory Animal Science	1	2	2
1710722	Molecular Pathology	3	2	4
1712721	Molecular Physics	2	2	3
1719722	Molecular Oncology	3	2	4
1721722	Medical Informatics	2	2	3
		18	**12**	**24**
Elective Courses (6 Cr)				
1704722	Molecular Pharmacology	1	2	2
1707722	Molecular Parasitology	1	2	2
1708722	Molecular Immunology	1	2	2
1712722	Computational Biology	1	2	2
1713703	Molecular Genetics	1	2	2
1721720	Medical Statistics	1	2	2

Course Description of the courses offered by Molecular Biomedicine Department

1722701 Molecular Biology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
3	2	4

- RNA types and structures, RNA functions, Transcription-Prokaryotypes.
- Bacterial RNA polymerase and promoters, Operons and regulons.
- Transcription-Eukaryotypes, Eukaryotic RNA polymerases and promoters.
- General trans criptionfactors of eukaryotes.
- Eukaryotic transcription activators and repressors.
- Capping and polyadenylation of RNA, RNA splicing, RNA editing.
- Nucleosomes and transcription.
- Regulation of RNA synthesis in normal and neoplastic cells.
- Catalysis by RNAs.

1722702 Special Topics in Molecular Biology

Hour/Week		
Theoretical	**Practical**	**Total Cr**
4	--	4

It will cover new topics of field such as Molecular basis of genetic diseases, Identifying genetic mutation, bioinformatics, pharmacogenomics, Genomics stem cell and therapy, stem cell cancers, strategy for stem cell

1722621 Molecular biology of pain

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	-	1

1- Introduction in molecular biology
2- Physiological and pathological pain at the cellular, subcellular and molecular levels.
3- Sensory molecular biology of pain:
   - Mechanisms about how pain is initiated, encoded, conducted, transmitted, modulated and perceived.
4- Modern electrophysiology in pain :
   -Role of synaptic plasticity in pain processing in the spinal cord and brain.
5- Genomics and proteomic aspect of pain:
   -Help identify changes in the array of molecules present in cells under chronic pain conditions.
6- New molecules related to pain and use in management of difficult chronic pain syndromes:
   - Molecular targets at different levels along sensory pathways are keys to future identification of new drugs and therapies that effectively manage intractable pain conditions with low side effects..

Elective Courses Offered by

1718700 - Department of Radiodiagnosis

1718620 Radiodiagnosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

Basic: Principles of X-Ray production, MRI, US & Doppler
Basic Principles of CT , isotope study and PET, Radiological anatomy of the spine and Imaging of low back pain.
Radiological anatomy of the neck and brachial plexus, shoulder joint, hip joint & ankle joint
Radiological anatomy of the abdomen and pelvis

1718720 Radiodiagnosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	٢	2	3

Basic Principles of X-Ray production, MRI , US & Doppler
Basic Principles of CT,isotope study and PET
Radiological anatomy of the spine and Imaging of low back pain.
Radiological anatomy of the neck and brachial plexus, shoulder joint, hip joint and ankle joint
Radiological anatomy of the abdomen and pelvis
Imaging of low back pain , neck pain , shoulder joint, knee joint and ankle joint
Imaging of pelvis (sacroiliac joints pyriform syndrome).

1718721 Radiodiagnosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Basic: Principles of X-Ray production
Basic: Principles of MRI .
Basic: Principles of US & Doppler
Basic: Principles of CT
Basic: Principles of isotope study and PET
Radiological anatomy of the spine
Imaging of low back pain.
Radiological anatomy of the neck and brachial plexus
Radiological anatomy of the shoulder joint
Radiological anatomy of the hip joint
Radiological anatomy of the abdomen and pelvis
Radiological bone age
Radiological diagnosis of Achondroplasia

1718821 Radiodignosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

- Basic: Principles of X-Ray production
- Basic: Principles of MRI .
- Basic: Principles of US & Doppler
- Basic: Principles of CT
- Basic: Principles of isotope study and PET
- Radiological anatomy of bone developments
- Radiological aspects of bone aging.
- Congenital Skeletal anomalies
- Dysplasias of bones
- congenital gene related CNS abnormalities
- Congenital gene related GIT abnormalities
- Congenital geneti related Urinary tract abnormalitie

1718822 Radiodiagnosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	-	1

Interventional mangament of cervical pain
nterventional mangament of pelvic pain
nterventional mangament of joint pain

1718823 Radiodiagnosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

Intterventiional mangament of post operative pain
Intterventiional mangament of upper obdominal pain
Intterventiional mangament of post eperative pain
Intterventiional mangament of low bock pain
tIntterventiional mangament of peripheral nerve block

1718824 Radiodiagnosis	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	1	1	1.5

Basic Principles of X-Ray production, MRI, US & Doppler
Basic Principles of CT, isotope study and PET
Advanced Imaging of chronic hemolytic anemia
Advanced Imaging of coagulopathy
Advanced Imaging of leukaemia

1718820 Radiodiagnos	**Hour/week**		
	Theoretical	**Practical**	**Total Cr**
	1	2	2

- X-Ray, X ray equipment, Image intensifier
- X ray generation projection Angiography, Digital Angiography
- Digital image processor. Image storage
- Principle of mammography , Physics of image formation, Mammography equipment, Digital mammography
- Basic: Principles of MRI .
- Basic: Principles of US & Doppler
- Computed tomography, Instrumentation, Data acquisition geometrics, CT detectors, Image reconstruction principles , CT generations.
- Magnetic Resonance Imaging, Fundamental of MRI, Fundamental of MRI instruments, Static field magnet, Gradient coil, Digital data processing, Function MRI, Mechanism
- Nuclear medicine, Principles of isotope study and PET

Elective Courses Offered by

1719600 - Department of Cancer Management and Research

Description of the courses offered by the Cancer Management and Research Department

1719722 Molecular Oncology	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	3	2	4

- Introduction: Cancer Biology.
- Multistep Model of Cancer Progression.
- Genetic Alterations in Cancer Cells.
- Oncogenes.
- Tumor Suppressor Genes.
- Telomerase and Cancer.
- DNA Repair and Cancer.
- Transcription factors.
- Control of the cell proliferative cycle.
- Signaling pathways.
- Apoptosis.
- Metastatic Progression.
- Overview Cancer Therapies.

1719820 Nuclear Medicine	**Hour/Week**		
	Theoretical	**Practical**	**Total Cr**
	2	2	3

This course is designed to teach students the basics of physics related to nuclear medicine, Radiobiological aspects of ionizing radiation,
Principles of Radiation protection, and Clinical application (diagnosis and treatment) of radioactive isotopes in different diseases benign and malignant.

Diploma Degree in Breast Imaging

1718600 – Department of Radiodiagnosis

Admission Requirements: -Candidates allowed for registration are post-graduate medical students who finished specialization in Radiodiagnosis including:- Diploma , Master, MD, and Egyptian Membership in Radiodiagnosis.

Core courses (24 Cr): 1718601,1718602,1714620,1719620, 1710620, 1718603, 1718604, 1718605, 1718606

Elective courses (6Cr): 1718607, 1718608, 1718609, 1718610

(Core courses (24 Cr)

Code	Name	Houres/week		
		Theoretical	Practical	Total cr
1718601	-Radiological anatomy, Technique and Quality control in mammography	1	2	2
1718602	- Physics of imaging modalities	2	-	2
1714620	-Surgery of breast lesions.	2	-	2
1719620	-Oncological treatment of breast cancer	2	-	2
1710620	-Histoimmunopathology	2	-	2
1718603	-Breast imaging I (Benign lesions)	2	4	4
1718604	-Breast imaging II (Malignant lesions)	2	4	4
1718605	-Breast imaging III (Screening program for breast cancer)	1	2	2
1718606	-Breast imaging IV (Interpretation of breast images)	2	4	4
		16	16	24

Elective courses (6 Cr)

Code	Course			
1718607	Breast imaging V(Breast MRI)	2	2	3
1718608	Breast imaging VI(New imaging modalities of breast)	2	2	3
1718609	Breast imaging VII (Interventional techniques)	2	2	3
1718610	Breast Imaging VIII (Case presentations)	1	4	3

Course description of Diploma in breast imaging

Code	Hour/Week		
1718601 Radiological anatomy, Technique and Quality control in mammography	**Theoretical**	**Practical**	**Total Cr**
	1	2	2

Detailed breast and axillary nodes anatomy in mammography, and ultrasonography, Technical aspects for analogue and digital mammography, Technical aspects of high resolution Ultrasonography of breasts, Technical and personal factors in quality control of both mammography and US.

1718602 Physics of imaging modalities	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Principles of X-ray analogue mammography, Principles of digital mammography, Radiation hazards to breasts, Radiation dose. - Principles of Ultrasonography

1714620 Surgery of breast lesions	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Clinical examination of breasts, Staging of breast cancer- Sentinal lymphnodes localization.- Role of surgery in breast diseases, Conservative non-surgical management, Conservative surgical management, Radical surgical management

1719620 Oncological treatment of breast cancer	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Tumor markers- Hormonal receptors- Staging of breast cancer- Gene-related breast cancer- Pre-surgical chemo or radiotherapy, Post-surgery chemotherapy, hormonal therapy and radiotherapy, Palliative chemotherapy.

1710620 Histoimmunopathology	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	-	2

Histology of normal breast tissue- Classifications of breast lesions- Grading of breast cancer- Value of fine-needle aspiration and core biopsy- Histopathological Criteria of benign breast lesions., Histopathological criteria of malignant breast lesions.

1718603 Breast imaging I (Benign breast lesions)	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

Classification of benign breast lesions- Mammographic features of benign breast lesions - Ultrasonographic features of breast benign lesions - BI-RADS classification I, II, and III

1718604 Breast imaging II (Malignant breast lesions)	Hour/Week		
	Theoretical	**Practical**	**Total Cr**
	2	4	4

Classification of malignant breast lesions Mammographic features of malignant breast lesions – Ultrasonographic features of malignant breast lesions – Imaging of equivocal breast lesions –BI-RADS classification IV, V, and VI

1718605 Breast imaging III (screening program for breast cancer)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	2	2

Screening program for breast cancer- Age of Screening- High risky females
Annual or Two years- schedule screening program- Single view or complete study- Indications of Screening by MR-mammography

1718606 Breast imaging IV (Interpretation)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	4	4

Interpretation : Type of breast parenchyma (ACR) , Normal mammographic features, How to pick pathological signs.in mammography and Ultrasonography,
Signs of breast lesions., BI-RADS classification – Breast calcifications; Types of micro and course breast calcifications.

1718607 - Breast imaging V (Breast MRI)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Breast MRI : Principle of MRI, Requirements Technique of breast MRI, Dynamic MRI , Types of dynamic curves- MR-diffusion & MR-spectroscopy, BI-RADS classification

1718608 - Breast imaging VI (New imaging modalities of breast)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Positron emission tomography (PET) : principle and interpretation, Doppler ultrasonography- US-elastography in breast lesions, Role of CT-PET in cancer breast imaging.- Role of Tomosynthesis in detection of breast lesions.

1718609 - Breast imaging VII (Interventional techniques)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

- Interventional techniques ,Pre-biopsy investigation, Imaging –guided fine -needle aspiration, Imaging–guided true-cut biopsy , wire localization.. US-guided aspiration of cyst or seroma.

1718610 - Breast Imaging VIII (Case presentations)

Hour/Week		
Theoretical	**Practical**	**Total Cr**
1	4	3

- Short review and discussion about every case, Practical sessions of case presentations including all modalities US, mammography, MRI, PET..
- Correlation between imaging features of breast lesions and histopathological study.- Breast lesions mimicking cancer.

Diploma in Health Governance

1700670 – Multi-disciplinary

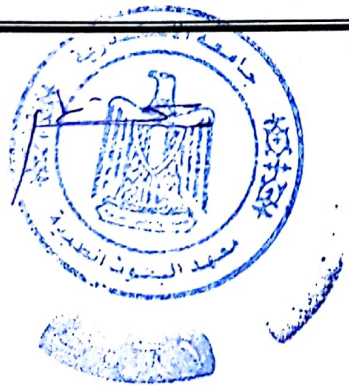
- **Admission Requirements:** Candidates allowed for registration are post-graduate students holding a bachelor degree in Medicine or an equivalent/ corresponding field from an accredited university
- Number of credit hours required for the degree is 30 credit hours.

Program Content

Core courses: 24 Cr

Elective courses: 6 Cr

Code	Course			
1700671	Principles of good governance	3	2	4
1700672	Clinical governance	3	2	4
1700673	Institutional governance	3	2	4
1700674	Health governance	3	2	4
1700675	Performance control	3	2	4
1700676	Evidence base practice	3	2	4
Elective Courses				
1700677	Legal and ethical essentials	2	2	3
1700678	Patient and public engagement	2	2	3
1700679	Research governance	2	2	3
1700680	Leadership	2	2	3



Course description of Diploma in Health Governance

Code	Hour/Week		
	Theoretical	Practical	Total Cr
1700671 Principles of good governance	3	2	4

The course will introduce the participants to the concept of good governance, the different existing perspectives, public versus corporate, the UN agencies contribution in its definition and the main challenges in its application. Participants will explore the main principles of good governance: Participation, the rule of law, the transparency of administrative processes and procedures, accountability towards all stakeholders, responsiveness to the needs of stakeholders, equity principles to ensure that everybody is included in the access to quality health care, effectiveness and efficiency. Good governance means that health institutions produce results that meet the needs of society while making the best and sustainable use of resources at their disposal.

	Hour/Week		
	Theoretical	Practical	Total Cr
1700672 Clinical governance	3	2	4

The course addresses the important issue of ensuring the safest and highest quality care services within the existing system constraints. Participants will understand clinical effectiveness, how appropriate care must be based on best evidence from research, familiarize with quality improvement processes such as clinical audit, learn about clinical risk management framework, tools, and clinical incidence analysis. Tools and methods for corrective actions to minimize risk occurrence will be presented and discussed. Through teamwork students will acquire the necessary skills of an effective team leader. Knowledge on data handling, development of skills for data collection, data monitoring and use of information for evidence based decision will also be provided.

	Hour/Week		
	Theoretical	Practical	Total Cr
1700673 Institutional governance	3	2	4

Institutional governance is key for any health related organization to achieve its mission and goals. Participants will acquire knowledge and skills in analyzing the principles of ownership, board infrastructure and composition, resources and systems essential for an effective governing board, master stakeholder analysis process, learn the foundations for the development and analysis of policies (to clarify boards expectations), acquire skills in decision making processes and techniques and finally, get the tools for performance monitoring to ensure that the course of action is aligned with the institutional goals and strategies.

	Hour/Week		
	Theoretical	Practical	Total Cr
1700674 Health governance	3	2	4

The course addresses the theme of health planning; participants will acquire knowledge, competence and skills on strategic planning of health services, on analysis of the health policy context, on criteria for priority setting. Tools to carry out a health needs assessment / health situation analysis will be provided. Participants will develop skills on data gathering, data analyses to identify main health problem and discuss health needs and their characteristics and clinical and social determinants. This will lead participants and describe the characteristics and purpose of health need assessment. Financial dimension will be examined. Basic knowledge on cost and costing methodologies for health services will also be acquired by participants.

1700675 Performance control

Hour/Week		
Theoretical	Practical	Total Cr
3	2	4

Through this course participants will acquire knowledge, skills and competencies in quality measures using data to evaluate the performance of health plans and health care providers against quality standards. Financial dimension will be introduced, they will develop knowledge of financial terminology and reading of financial statements. The participants will develop competences in evaluating professional performance against the standards and will familiarize with the Egyptian accreditation standards and its application in health care settings.

1700676 Evidence based practice

Hour/Week		
Theoretical	Practical	Total Cr
2	3	4

The course will promote evidence based practice and a conscientious and judicious use of best evidence in health care decision making. Criteria for implementation and knowledge transfer. Participants will acquire appraisal skills to assess evidence based research on the bases of its validity and relevance, and on the process of development of clinical guidelines. They will be instructed on the structure of guidelines, process of their development and will get acquainted with main clearing houses. Furthermore, the course will address the utilization of decision aids and the benefits and the challenges of formulation of evidence based policy making.

Elective Courses

1700677 Legal and ethical essentials

Hour/Week		
Theoretical	Practical	Total Cr
2	2	3

The course will address healthcare ethics and provide an overview of the laws governing health care institutions, the ethical dilemmas facing managers and providers in healthcare institutions. The responsibilities of management, staff, physicians, nurses and other clinical and support staff are examined, tort and criminal law / public health law is reviewed, legally responsible bodies, legal mechanisms, legal responsibility of public and private healthcare providers in preventable harms, institutional ethics and responsibilities, staff rights and responsibilities, patient rights and responsibilities are examined and discussed.

1700678 Patient and public engagement)

Hour/Week		
Theoretical	Practical	Total Cr
2	2	3

Through this course the participants will review patient and public engagement framework at different healthcare levels, be sensitized on the relevance of health literacy, learn foundations of health communication skills with patients, and will be provided with tools to self-improvement in doctor/staff - patient communication management. Participants will be acquainted with shared decision making principles and practice, decision support tools to ensure that patient and clinicians work together to clarify appropriate treatment. The course will expose participants to the value of involvement of public representatives in policy making, health planning and priority setting related to resources and research.

1700679 Research governance

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

Research in health is critical to upgrade the provision of care and for the wellbeing of individuals and the society. Research Governance is about ensuring the trust of the public in the research community. The course will present how governance applies to the full range of research types, contexts and methods. Issue of ethics, responsibility and accountability are illustrated and analyzed through the discussion of case studies. Regulation of clinical trials, ethics applied to research, roles and responsibility of ethical research committees, regulatory bodies clinical trials national regulation, code of ethics and protections of participants. Participants will be able to understand the main advantages of qualitative versus quantitative research and its utilization in decision making process.

1700680 Leadership

Hour/Week		
Theoretical	**Practical**	**Total Cr**
2	2	3

This course will provide the knowledge, competence and skills to become an efficient healthcare leader, to adopt leadership strategies, discuss different leadership styles and factors affecting leadership and differentiate between leadership and management, define power and discuss its sources and uses. Participants will develop skills in conflict management, delegation processes, key elements for effective delegation and its benefits, obstacles of effective delegation. Team building, factors affecting team management. In the rapid changing world participants will be discussing change strategies, change management and how to handle resistance to change.

Master in Laboratory and Clinical Hematological Researches
1705700-Department of Haematology

Admission Requirements: Graduate students with a M.B.CH.B of Medicine
Core Courses (26 CH): 1705709, 1705711, 1705712, 1705713, 1705714, 1705715, 1705716, 1705717, 1705718, 1705719.
Elective Courses (4 CH):1706720, 1710720, 1715721, 1721720, 1717720.
M.Sc Thesis: (8 CH)

Code	Name	Hours/Week		
Core Courses (26 Credit Hours)		**Theoretical**	**Practical**	**Total CH**
1705709	Hematological Cell biology	2	0	2
1705711	Hematological Immunology	1	0	1
1705712	Hematological molecular biology and cytogenetics.	2	2	3
1705713	Transfusion medicine	2	2	3
1705714	Pharmacology of hematological drugs	2	0	2
1705715	Basic laboratory techniques	1	4	3
1705716	Benign Laboratory Haematopathology	1	4	3
1705717	Malignant Laboratory Haematopathology	1	4	3
1705718	Clinical Benign Haematology	2	2	3
1705719	Clinical malignant Haematology	2	2	3
		16	20	26

Elective Courses (4 Credit Hours)				
1706720	Bacteriology	1	2	2
1710720	Pathology	1	2	2
1715721	Internal Medicine for hematology	1	2	2
1721720	Medical statistics	1	2	2
1717720	Chemical pathology	1	2	2