المجلس الأعلى للجامعات

لجنة قطاع الدراسات الصيدلية

اللائحة الداخلية

لبرنامج

بكالوريوس الصيدلة (فارم دي)
Pharm D

طبقا لنظام الساعات المعتمدة لكلية الصيدلة- جامعة قناة السويس

(يوليو - 2019)

المحتوى

رؤية و رسالة و أهداف كلية الصيدلة- جامعة قناة السويس

الرؤيــة:

تسعى كلية الصيدلة- جامعة قناة السويس لأن تكون إحدى الكليات الرائدة فى مجال الصيدلة على المستوى المحلى و الإقليمي و العالمي وأن تحظى بقدرة تنافسية من حيث جودة التعليم و الأبحاث العلمية و خدمة المجتمع المدني.

الرسالة:

تهدف كلية الصيدلة – جامعة قناة السويس إلى تخريج طلاب ذوى قدرة تنافسية عالية على المستوى المحلى و الإقليمي وذلك بأن توفر لطلابها تعليما صيدليا متميزا و مستمرا، كما تهدف إلى المساهمة في تنمية المجتمع المحلى و الإقليمي من خلال مواكبة منظومة البحث العلمي، وتهتم الكلية بترسيخ مبادئ و آداب و أخلاقيات مهنة الصيدلة في خريجيها.

أهـداف الكلية:

1- تطوير برامج و مقررات مرحلة البكالوريوس.
2- توفير فرص التعلم وتطوير أساليب التعليم والتسهيلات الداعمة.
3- اكتساب ثقة المجتمع الداخلي والخارجي في الكلية والارتقاء بمستوى الطلاب والخريجين.
4- الارتقاء بمستوى أعضاء هيئة التدريس والهيئة المعاونة.
5- تطوير واعتماد برامج الدراسات العليا.
6- الارتقاء بمستوى البحث العلمي والأنشطة العلمية
7- مساهمة البحث العلمى في دعم و تعزيز العملية التعليمية
8- تلبية احتياجات المجتمع وتنمية البيئة.
9- تطوير المنظومة الإدارية بالكلية.
10- تطوير البنية التحتية للكلية.

الأقسام العلمية :

1. قسم الصيدلانيات و الصيدلة الصناعية
2. قسم العقاقير
3. - قسم الأدوية والسموم
4. قسم الميكروبيولوجى والمناعة
5. قسم الكيمياء التحليلية الصيدلية
6. قسم الكيمياء الطبية
7. قسم الكيمياء الحيوية والبيولوجية الجزيئية
8. قسم الكيمياء العضوية الصيدلية
9. قسم الممارسة الصيدلية

مواد اللائحة

مادة (1) :

رؤية البرنامج

التميز العلمي والتطوير المستمر لخدمة المنظومة الصحية العلاجية و الصناعة الدوائية و تحقيق التنمية المستدامة من أجل الوصول لمكانة مرموقة عالميا في مجال الصيدلة .

رسالة البرنامج

إعداد صيادلة يتحلون بأخلاق المهنة و مؤهلين بأحدث المفاهيم الصيدلية والرعاية العلاجية التى تمكنهم المساهمة في تطوير الصناعات الدوائية و رفع كفاءة منظومة الرعاية الصيدلية على المستوى المحلي والإقليمي في المستشفيات و الصيدليات الاهلية من خلال تقديم الخدمات الصيدلية بمستوى مهاري محترف بالصيدليات العامة والخاصة ومصانع وشركات الأدوية ومعامل الرقابة الدوائية وتحليل الأغذية بالإضافة إلى العمل في مجال الإعلام والتسويق الدوائي والمشاركة بفاعلية في البحث العلمي من خلال مراكز البحوث والجامعات لخدمة المجتمع.

أهداف البرنامج

- تخريج صيدلي متميز مؤهل للعمل بالصيدليات العامة والخاصة ومصانع وشركات الأدوية ومعامل الرقابة الدوائية وتحليل الأغذية والعمل في مجال الاعلام والتسويق والبحوث والجامعات.
- التركيز على دور الصيدلي في تقديم الرعاية الصحية المناسبة للمريض بداخل المستشفيات وخارجها من خلال تثقيف وتقديم المشورة للأفراد والمجتمعات لتحسين النتائج العلاجية والحد من الإصابة بالامراض مع مراعاة أن يمارس المهنة بمسؤولياتها وسلطاتها محترماً قوانينها وأخلاقياتها، واحترام حقوق المرضى.
- إعداد صيدلى يستخدم البيانات التى تستند على الدلائل لتقديم المستحضرات الصيدلية المعاصرة والخدمات الصيدلية بالإضافة الى ان يكون متمكنا من مهارات التواصل الفعال والقيادة والإدارة وريادة الأعمال.
- تخريج صيدلى يعمل كمتعلم مدى الحياة بهدف التنمية المهنية المستدامة و يظهر القدرة على مهارات تقييم الأداء والتقييم الذاتي.
- زيادة القدرة التنافسية لخريجي البرنامج على المستوى الإقليمي من خلال البرامج الدراسية والتدريبية.

- المشاركة في خدمة المجتمع وتنمية البيئة وتوفير عائد إقتصادي ملموس من خلال ترشيد إستخدام الأدوية في المستشفيات.
- الإلتزام بتحقيق معايير الجودة في التعليم الصيدلي من خلال التعليم التفاعلي والإهتمام بالتعلم الذاتي.

مادة (2) :

الدرجة العلمية التي تمنح للخريجين

يمنح مجلس الجامعة بناءً على طلب مجلس كلية الصيدلة بكالوريوس الصيدلة (فارم دي-PharmD) طبقا لنظام الساعات المعتمدة.

مادة (3) :

التأهيل للدرجات الأكاديمية الأعلى:
درجة بكالوريوس الصيدلة (فارم دي-Pharm D)هى الدرجة الجامعية الأولى فى مجال الصيدلة اللازمة للحصول على ترخيص ممارسة المهنة فى جميع المجالات الصيدلية المتاحة ، كما تؤهل الخريج للتسجيل لدرجة الماجستير فى أى من الأقسام العلمية فى الكلية.

مادة (4) :

نظـام الدراسـة

مدة الدراسة بالبرنامج خمس سنوات دراسية (خمس مستويات على عشر فصول دراسية) طبقا لنظام الساعات المعتمدة وسنة تدريب متقدم (امتياز) فى مواقع العمل (5+1). بالإضافة إلى **عدد 100 ساعة** تدريب ميدانى فعلية فى الصيدليات الأهلية والحكومية وصيدليات المستشفيات تتم خلال الأجازات الصيفية لسنوات الدراسة بعد نهاية المستوى الثالث و قبل البدء فى سنة الامتياز.

ينقسم كل مستوى (عام) دراسي إلى فصلين دراسيين (الخريف والربيع) ومدة كل فصل دراسي خمسة عشر أسبوعا. ويجوز طرح بعض المقررات في فصل دراسي صيفي مدته من ستة إلى ثمانية أسابيع من الدراسة المكثفة.

الساعة المعتمدة هي وحدة قياس دراسية وتعادل ساعة دراسية أسبوعية نظرية أو درساً عملياً لا تقل مدته عن ساعتين أسبوعياً وتدرس على مدى فصل دراسي واحد.

مادة (5) :

تصميم البرنامج الدراسي

يتم تصميم البرنامج الدراسي بحيث يكون التعلم عن طريق المحاضرات النظرية وحلقات النقاش والدروس العملية و ورش العمل والتدريبات الميدانية و إجراء بحوث و تقديم العروض بالإضافة إلى التعاون مع المجتمع المحيط بالجامعة.

و يتم تصميم البرنامج الدراسي بحيث:

أولا : عدد الساعات المعتمدة **175** ساعة معتمدة بالإضافة إلى إجتياز ما تقرره الجامعة من متطلبات التخرج علي ألا يتضمنها حساب المعدل الفصلي أو التراكمي للطالب.

ثانيا : ألا تقل عدد المقررات الإختيارية عن أربعة مقررات (8 ساعات معتمدة) يتم اختيارها من القائمة التى تحددها الكلية. هذا بالإضافة إلى 100 ساعة تدريب صيفى فعلية يبدأ بنهاية المستوى الثالث و قبل البدء فى سنة الامتياز.

ثالثا : المقررات الاختيارية للطالب في المستويين الآخرين يفضّل ان تحقق له جدارات و مهارات تساعده على التوجه المهني والتخصص. وأن يكون أحد المقررات الإختيارية فى أحدى المجالات الصيدلية الإكلينيكية.

مادة (6) :

التسجيل

تحدد الكلية لكل مجموعة من الطلاب مرشداً أكاديمياً من أعضاء هيئة التدريس يقوم بمهام الرعاية والإرشاد ويكون مسئولاً عن الطالب في الشئون العلمية والإجتماعية والنفسية وتوجيهه في كل ما يتعلق بحياته الجامعية ويقوم بمساعدة الطلاب في اختيار المقررات من قائمة المقررات التي تطرحها الكلية في كل فصل دراسي.

وعلى كل طالب أن يقوم شخصياً بتسجيل المقررات التي يرغب في دراستها في كل فصل دراسي مع ضرورة أن يتم اختيار المقررات وعدد الساعات المعتمدة بالتشاور والاتفاق مع المرشد الأكاديمي.

ويشترط لتسجيل المقرر أن يكون الطالب قد اجتاز بنجاح متطلب التسجيل لهذا المقرر.

ويجوز لمجلس الكلية في حالات الضرورة القصوى للطالب بتسجيل بعض المقررات بالتوازي مع متطلباتها التي لم يجتازها الطالب بنجاح إذا قل العبء الدراسي المتاح للطالب عن 12 ساعة معتمدة (أنظر التالي – فقرة أ – العبء الدراسي) ، على أن يتم كتابة إقرار بمعرفة ولي أمر الطالب بأنه لن يتم اعتماد نجاحه في هذا المقرر إلا بعد اجتياز متطلبه الذي سمح له بالتسجيل فيه بالتوازي.

وينبغى أن يملأ الطالب نموذج تسجيل المقررات في الأوقات المحددة حسب التقويم الجامعي المعلن لكل فصل دراسي ولا يجوز الانتظام في الدراسة إلا بعد انتهاء عملية التسجيل.

لا يسمح للطالب بالتسجيل المتأخر عن الأوقات المحددة إلا بعذر قهري يقبله مجلس الكلية وعلى ألا تزيد مدة التأخير عن أسبوع من نهاية فترة التسجيل.

أ) العـبء الدراسـي :

العبء الدراسي هو عدد الساعات المعتمدة التي يقوم الطالب بتسجيلها في الفصل الدراسي الواحد ويجب مراعاة ألا يقل العبء الدراسي المسجل للطالب في أي فصل دراسي عن 12 ساعة معتمدة وألا يزيد عن 22 ساعة معتمدة و على الا يزيد العبء الدراسي للطالب المتعثر عن 12 ساعة معتمدة (أنظر مادة 12) .

العبء الدراسي خلال الفصل الصيفي بحد أقصى 10 ساعات معتمدة.

ويجوز لمجلس الكلية السماح للطالب في أخر فصلين دراسيين بزيادة العبء الدراسي عن الحد الأقصى وبما لا يتجاوز عدد 3 ساعات معتمدة (يستفيد منها الطالب لمرة واحدة)، كما يجوز لمجلس الكلية السماح للطالب المتعثر (أنظر مادة 12 - التعثرالأكاديمي) بزيادة العبء الدراسي عن الحد الأقصى خلال الفصل الصيفي وبما لا يتجاوز عدد 2 ساعة معتمدة.

ب) الإضافة والحذف والانسحاب :

يجوز للطالب بعد إستكمال إجراءات التسجيل أن يضيف أو يحذف إلى ساعاته المعتمدة مقرراً أو أكثر في أي فصل دراسي على أن يكون ذلك في خلال الفترات المحددة حسب التقويم الجامعي المعلن لكل فصل دراسي مع مراعاة الحد الأدنى والحد الأقصى للعبء الدراسي.

كما يجوز للطالب بعد تسجيله الإنسحاب من مقرر أو أكثر في أي فصل دراسي دون أن يعتبر راسباً في هذا المقرر وذلك إذا تقدم بطلب الانسحاب خلال الفترات المحددة حسب التقويم الجامعي المعلن لكل فصل دراسي. ومن ينسحب بعد هذه الفترة المحددة يعتبر راسباً.

مادة (7) :

أ) المواظـبة

على الطالب أن يواظب على حضور المحاضرات النظرية وحلقات النقاش والدروس العملية والتدريبات الميدانية و التكليفات، ولمجلس الكلية بناءً على طلب مجالس الأقسام العلمية المختصة أن يحرم الطالب من التقدم للامتحان التحريري النهائي إذا تجاوزت نسبة غيابه 25% من إجمالي الساعات المعتمدة لكل مقرر.

ب) حضور الامتحانات والتغيب عنها والإخلال بنظامها

يجب على الطالب أداء الامتحانات التحريرية النهائية في المواعيد المقررة لها حسب التقويم الجامعي المعلن لكل فصل دراسي ، ويعتبر الطالب المتغيب عن الامتحان التحريري النهائي راسبا في المقررات التي تغيب عن أداء الامتحان فيها. لا يعتبر الطالب راسبا في حالة التغيب بعذر قهري يقبله مجلس الكلية.

مادة (8) :

لغـة الدراسـة

الدراسة في البرنامج باللغة الانجليزية. ويجوز مع ذلك تدريس بعض المقررات باللغة العربية بناءً على توصية القسم العلمي المختص وموافقة مجلسي الكلية والجامعة.

مادة (9) :

التدريــب الميداني الاولى و التدريب الميدانى المتقدم (سنة الامتياز)

أ-التدريب الميدانى الأولى :

على الطالب أن يكمل فترة تدريب ميداني أولى بإجمالي عدد 100 ساعة تدريب فعلية فى الصيدليات الأهلية والحكومية وصيدليات المستشفيات التي يقرها مجلس الكلية وذلك تحت إشراف عضو هيئة تدريس و يتم التدريب خلال الأجازات الصيفية لسنوات الدراسة بعد نهاية المستوى الثالث وقبل البدء فى سنة الامتياز.

ب- التدريب الميدانى المتقدم (سنة الامتياز):

- على الطالب أن يكمل سنة الامتياز (سنة أكاديمية بمعنى 9 اشهر) بعد الانتهاء من السنوات الدراسية بالتدريب فى شركات ومصانع الأدوية البشرية والبيطرية - شركات ومصانع: المستلزمات والأجهزة الطبية ومستحضرات التجميل والمكملات الغذائية والأعشاب والنباتات الطبية والمطهرات والمبيدات - شركات التوزيع ومخازن الأدوية - مراكز وهيئات الرقابة والمتابعة الدوائية المحلية والعالمية (MOH-CAPA-NODCAR-…;WHO,FDA,EMA..etc) - مراكز البحوث الصيدلية والطبية والإتاحة الحيوية والدراسات السريرية (CROs)- الأعلام والتسويق الدوائى..... إلخ ، بالإضافة إلى المستشفيات والصيدليات الخاصة والحكومية .ويمكن لمن يرغب فى التخصص فى المجال الأكاديمى (التدريس والبحث) قضاء فترة تدريبية فى كليات الصيدلة اومراكز البحوث . ويجب أن يشمل برنامج التدريب دورة تدريبية واحدة من دورات التدريب الإكلينيكى.

(يتم إعداد لائحة تفصيلية خاصة ببرنامج تدريب سنة الامتياز).

مادة (10) :

شروط القبول

يشترط فيمن يتقدم للالتحاق بالبرنامج أن يستوفي كافة الشروط التي يحددها المجلس الأعلى للجامعات.

يجوز قبول تحويل الطلاب المقيدين ببرنامج مماثل في إحدى كليات الصيدلة بالجامعات المصرية أو الأجنبية بشرط استيفاء الطالب لمتطلبات القبول بالكلية وتحتسب للطالب المقررات التي درسها في الكلية المحول منها وفقاً للقواعد التي يحددها مجلس الكلية.

مادة (11) :

نظـــام التقييـــم

تتكون الدرجة النهائية للمقرر من مجموع درجات الأعمال الفصلية والعملية والتحريرية والشفهية كما هو موضح بجداول الخطة الدراسية.

الحد الأدنى للنجاح في أي مقرر هو 60% من مجموع درجات هذا المقرر ، ولا يكون الطالب ناجحاً في أي مقرر إلا إذا حصل على 30% من درجة الامتحان التحريري النهائي ، وتكون النسبة المئوية للدرجات النهائية والتقديرات كما هو مبين بالجدول التالي.

نظـــام التقيـــيم

النسبة المئوية	عدد النقاط	الرمز	التقدير
95 فأكثر	4	A^+	ممتاز
90 لأقل من 95	3,85	A	
85 لأقل من 90	3,7	A^-	
82,5 لأقل من 85	3,3	B^+	جيد جدا
77,5 لأقل من 82,5	3	B	
75 لأقل من 77.5	2,7	B^-	
72,5 لأقل من 75	2,3	C^+	جيد
67,5 لأقل من 72,5	2	C	
65 لأقل من 67,5	1.7	C^-	
62,5 لأقل من 65	1,3	D^+	مقبول
60 لأقل من 62,5	1	D	
أقل من 60	0,00	F	راسب
منسحب	-	W	منسحب
غير مكتمل	-	I*	غير مكتمل
غائب	-	Abs E**	غائب

*I : يحصل الطالب على هذا الرمز إذا كانت نسبة الحضور مستوفاة وتعذر عليه دخول الإمتحان التحريري النهائي والشفهي (إن وجد) لمقرر دراسي أو أكثر في ذات الفصل الدراسي لأسباب قهرية يقبلها مجلس الكلية ، وعليه أداء الإمتحان التحريري النهائي والشفهي (إن وجد) فقط في موعد أقصاه الأسبوع الثاني من الفصل الدراسي التالي مع الإحتفاظ بالتقدير.

**Abs E : يحصل الطالب على هذا الرمز إذا لم يتمكن من دخول الإمتحان التحريري النهائي والشفهي (إن وجد) في الموعد السالف ذكره في الفقرة السابقة (I) لعدم زوال السبب القهري ويتحتم على الطالب التسجيل في هذا المقرر عند طرحه مرة أخرى ودراسته كاملاً مع الاحتفاظ بالتقدير.

توجد رموز أخرى للتقييم لا تقابلها نقاط – تستخدم في بعض متطلبات التخرج - وهي:

S: مستوى مرضي
U: مستوى غير مرضي
T: درجات حصل عليها طالب محول من كلية صيدلة أخرى

يتم حساب المعدل الفصلي للطالب (GPA) والمعدل التراكمي (cGPA) على النحو التالي:

أ- يتم ضرب قيمة تقدير كل مقرر دراسي (النقاط الموضحة في الجدول السابق) في عدد الساعات المعتمدة لهذا المقرر لنحصل على عدد النقاط الخاصة بكل مقرر في الفصل الدراسي.

ب- يتم جمع نقاط كافة المقررات الدراسية التي سجل فيها الطالب في الفصل الدراسي الواحد.

ج- يتم قسمة مجموع نقاط كافة المقررات الدراسية على إجمالي الساعات المعتمدة المسجلة للطالب فى الفصل الدراسى الواحد وذلك بغرض الحصول على المعدل الفصلي كما يلي:

$$\text{المعدل الفصلي (GPA)} = \frac{\text{مجموع نقاط كافة المقررات الدراسية في الفصل الدراسي الواحد}}{\text{إجمالى الساعات المعتمدة المسجلة في الفصل الدراسي الواحد}}$$

ويتم حساب المعدل التراكمي كما يلي:

$$\text{المعدل التراكمي (cGPA)} = \frac{\text{مجموع نقاط كافة المقررات الدراسية لكافة الفصول الدراسية}}{\text{إجمالى الساعات المعتمدة المسجلة لكافة الفصول الدراسية}}$$

مادة (12) :

الرسـوب في المقـررات

- في حالة تغيب الطالب بدون عذر يقبله مجلس الكلية عن أداء الامتحان التحريري النهائي.

- إذا حصل الطالب على أقل من 30% من درجة الامتحان التحريري النهائي.
- عدم تحقيق 60 % على الأقل من مجموع درجات المقرر.
- إذا رسب الطالب في أي مقرر إجباري في أي فصل دراسى فعليه دراسة ذات المقرر والامتحان فيه عند طرحه مرة أخرى ، أما إذا رسب في مقرر إختياري فبإمكانه إعادة دراسته أو دراسة مقرر إختياري آخر بديل لإكمال متطلبات التخرج ، وذلك بعد موافقة المرشد الأكاديمي واعتماد مجلس الكلية .

مادة (13) :

التعثر الأكاديمي

يعتبر الطالب متعثر اكاديميا إذا حصل على معدل فصلي (GPA) أقل من "1".

الطالب الذي يحصل على معدل فصلي (GPA) أقل من "1" لمدة ستة فصول دراسية متصلة أو في عشرة فصول دراسية غير متصلة يفصل من الكلية وذلك بعد العرض والموافقة من مجلس الكلية ولا يؤخذ في الإعتبار الفصول الصيفية إن وجدت.

يسمح للطالب المتعثر أن يعيد دراسة المقررات التي اجتازها بتقدير D وذلك لتحسين المعدل التراكمي وتحتسب الدرجة الأعلى التي يحصل عليها الطالب.

مادة (14) :

الانقطاع عن الدراسة

يعتبر الطالب منقطعاً عن الدراسة إذا لم يسجل في فصل دراسى أو انسحب من الفصل سواء ذلك بعذر أو بدون عذر.

ويجوز أن ينقطع الطالب فصلين دراسيين متتاليين أو ثلاثة فصول دراسية غير متتالية كحد أقصى بشرط الحصول على موافقة مجلس الكلية ، وفي حالة انقطاعه مدة أطول من ذلك بدون عذر يقبله مجلس الكلية ويوافق عليه مجلس الجامعة يطبق عليه النصوص الواردة باللائحة التنفيذية لقانون تنظيم الجامعات.

مادة (15) :

متطلبات الحصول على درجة بكالوريوس الصيدلة (فارم دي-Pharm D) يتطلب الحصول على درجة بكالوريوس الصيدلة (فارم دي-Pharm D) طبقا لنظام الساعات المعتمدة او ما يعادله ما يلي:

أولا : دراسة واجتياز عدد الساعات المعتمدة **175** ساعة معتمدة موزعة على عشرة فصول دراسية وتشمل **متطلبات الكلية الإجبارية 167** ساعة معتمدة (جدول توزيع المقررات) ومتطلبات الكلية الإختيارية وتمثل عدد **8** ساعات معتمدة ، على ألا يقل المعدل التراكمي عن واحد.

ثانيا: إجتياز فترة تدريب ميداني أولى باجمالي عدد 100 ساعة تدريب فعلية فى الصيدليات الأهلية والحكومية وصيدليات المستشفيات التي يقرها مجلس الكلية وذلك تحت إشراف عضو هيئة تدريس و يتم التدريب خلال

الأجازات الصيفية لسنوات الدراسة بعد نهاية المستوى الثالث وأن يكمل سنة الأمتياز (عام أكاديمى- 9 أشهر) بعد الأنتهاء من سنوات الدراسة ، طبقا للائحة التفصيلية الخاصة ببرنامج تدريب سنة الامتياز والتى تشمل مشروع التخرج فى إحدى التخصصات المطروحة.

ثالثا : اجتياز ما قد تقرره الجامعة من متطلبات للتخرج على ألا يتضمنها حساب المعدل الفصلي أو التراكمي للطالب.

مادة (16) :

نظام تأديب الطلاب

الطلاب المقيدون بالبرنامج خاضعون للنظام التأديبى المبين في قانون تنظيم الجامعات المصرية ولائحته التنفيذية.

مادة (17) :

كود الأقسام ومتطلبات البرنامج الدراسي (أنظر مرفق رقم 1)

مادة (18) :

الخطة الدراسية (مرفق 2)

مادة (19) :

محتوى المقررات الدراسية (أنظر مرفق 3)

مادة (20) :

تحديث المقررات الدراسية

يجوز تحديث نسبة لا تتجاوز 20% من محتوى المقررات الدراسية بناء على أقتراح مجلس القسم العلمى المختص وموافقة مجلس الكلية واعتماد مجلس الجامعة بعد إبداء المبررات اللازمة .

مادة (21) :

برنامج التدريب لسنة الإمتياز:

يتم وضع برنامج مفصل للتدريب للسنة النهائية (سنة الأمتياز) فى شكل دورات تناوبية فى ملحق به لائحة برنامج التدريب التناوبى بصورة ممنهجة تفصيلية.

مرفق 1

خاص بالمادة (17)

كود الأقسام ومتطلبات الجامعة والكلية والمقررات الإختيارية

1- كود الأقسام

Key for Course Abbreviations

MS	Mathematics
PB	Biochemistry
PC	Chemistry
PG	Pharmacognosy
PM	Microbiology and Immunology
PO	Pharmacology and Toxicology
PP	Pharmacy Practice/Clinical Pharmacy
PT	Pharmaceutics and Pharmaceutical Technology
MD	Medical Courses
NP	Non professional

1. The letter 'P' means that the courses are offered to students of Pharmacy only.
2. The first digit represents the semester number.
3. The second and third digits represent the course number.

2- متطلبات الجامعة

University Requirements: As determined by each University.

3- متطلبات الكلية

Faculty Requirements: See programme curriculum (Appendix 2)

Table 1: Courses offered by the Department of Pharmaceutics and Industrial Pharmacy

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
PT 101	Pharmacy Orientation	1	-	1
PT 102	Physical Pharmacy	2	1	3
PT 303	Pharmaceutics I	2	1	3
PT 404	Pharmaceutics II	2	1	3
PT 505	Pharmaceutics III	2	1	3
PT 606	Biopharmaceutics and Pharmacokinetics	2	1	3
PT 607	Pharmaceutics IV	2	1	3
PT 708	Pharmaceutical Technology I	2	1	3
PT 809	Pharmaceutical Technology II	2	1	3
PT 910	Good Manufacturing Practice	1	1	2
PT 011	Advanced Drug Delivery Systems	1	1	2
Total		19	10	29
PTE 1	Cosmetics	1	1	2
PTE 2	Good Manufacturing Practice	1	1	2
PTE 3	Mass Production of Pharmaceutical Products	1	1	2
PTE 4	Total Quality Management	1	1	2

Table 2. Courses offered by the Department of Pharmacognosy

Course Code	Course Title	Credit Hours		
		Lect.	**Pract./Tut**	**Total**
PG 101	Medicinal Plants	2	1	3
PG 202	Pharmacognosy I	2	1	3
PG 303	Pharmacognosy II	2	1	3
PG 504	Phytochemistry I	2	1	3
PG 605	Phytochemistry II	2	1	3
PG 706	Applied & Forensic Pharmacognosy	1	1	2
PG 907	Phytotherapy and Aromatherapy	2	1	3
Total		13	7	20
PGE 1	Plant Biotechnology	1	1	2
PGE 2	Production and Manufacture of Medicinal plants	1	1	2
PGE 3	Narcotics, Psychotropic and Toxic Plants	1	1	2
PGE 4	Marine Natural Products	1	1	2
PGE 5	Nutraceutical and Herbal Drugs Interaction	1	1	2

Table 3. Courses offered by the Department of Pharmacology and Toxicology

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
PO 401	Biostatistics	1	-	1
PO 304	Physiology and Pathophysiology	2	-	2
PO 502	Pharmacology I	2	1	3
PO 603	Pharmacology II	2	1	3
PO 704	Pharmacology III	2	1	3
PO 805	Drug Information	1	1	2
PO 806	Basic & Clinical Toxicology	2	1	3
Total		12	5	17
POE 1	Drug Abuse	1	1	2
POE 2	Immunopharmacology	1	1	2
POE 3	Pharmacogenetics	1	1	2
POE 4	Screening and Biological Standardization	1	1	2
POE 5	Veterinary Pharmacology	1	1	2

Table 4. Courses offered by the Department of Microbiology and Immunology

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
PM 401	General Microbiology and Immunology	2	1	3
PM 502	Pharmaceutical Microbiology	2	1	3
PM 603	Parasitology and Virology	2	1	3
PM 704	Medical Microbiology	2	1	3
PM 905	Biotechnology	2	1	3
PM 906	Public Health	2	-	2
Total		12	5	17
PME 1	Advanced Techniques in Microbiology and Immunology	1	1	2
PME 2	Antimicrobial stewardship	1	1	2
PME 3	Bioinformatics	1	1	2
PME 4	Infection control	1	1	2
PME 5	Marine microbiology	1	1	2

Table 5. Courses offered by the Department of Pharmaceutical Analytical Chemistry

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
PC 101	Pharmaceutical Analytical Chemistry I	2	1	3
PC 203	Pharmaceutical Analytical Chemistry II	2	1	3
PC 305	Pharmaceutical Analytical Chemistry III	2	1	3
PC 407	Instrumental Analysis	2	1	3
PC 011	Quality Control of Pharmaceuticals	2	1	3
Total		10	5	15
PCE 4	Cosmetics Analysis	1	1	2
PCE 5	Food Analysis	1	1	2
PCE 6	Assessment of Food contaminant	1	1	2
PCE 7	Green chemistry	1	1	2

Table 6. Courses offered by the Department of Medicinal Chemistry

Course Code	Course Title	Credit Hours		
		Total	Pract./Tut	Lect.
PC 508	Medicinal Chemistry I	2	1	3
PC 609	Medicinal Chemistry II	2	1	3
PC 710	Medicinal chemistry III	2	1	3
PC 801	Drug design	2	1	3
Total		8	4	12
PCE1	Drug discovery	1	1	2

Table 7. Courses offered by the Department of Biochemistry and Molecular Biology

Course Code	**Course Title**	**Credit Hours**		
		Lect.	**Pract./Tut**	**Total**
PB 201	Cell Biology	1	1	2
PB 402	Biochemistry I	2	1	3
PB 503	Biochemistry II	2	1	3
PB 704	Clinical Biochemistry	2	1	3
PB 901	Human Nutrition	1	1	2
Total		8	5	13
PBE 1	Introduction to Research Methodology	1	1	2
PBE 2	Biotechnology and Human Disease	1	1	2
PBE 3	Nutrition through life cycle	1	1	2
PBE 4	Therapeutic Nutrition	1	1	2

Table 8. Courses offered by the Department of Pharmaceutical Organic Chemistry

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
PC 102	Pharmaceutical Organic Chemistry I	2	1	3
PC 204	Pharmaceutical Organic Chemistry II	2	1	3
PC 306	Pharmaceutical Organic Chemistry III	2	1	3
Total		6	3	9
PCE 2	Polymers	1	1	2
PCE 3	Synthesis of Raw Materials	1	1	2

Table 9. Courses offered by the Department of Pharmacy practice.

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
PP 801	Clinical Pharmacokinetics	2	1	3
PP 802	Hospital Pharmacy	1	1	2
PP 803	Community Pharmacy Practice	2	1	3
PP 904	Clinical pharmacy I	2	1	3
PP 005	Drug interaction	1	1	2
PP 006	Clinical Pharmacy II & Pharmacotherapeutics	1	1	2
PP 007	Clinical Research, Pharmacoepidemiology and & Pharmacovigilance	1	1	2
Total		10	7	17
PPE1	Advanced Clinical Pharmacy	1	1	2
PPE2	Clinical Pharmacokinetics	1	1	2

Table 10. Medical Courses

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
MD 101	Medical Terminology	1	-	1
MD 202	Anatomy	1	1	2
MD 203	Psychology	1	-	1
MD 204	Histology	1	1	2
MD 405	Pathology	1	1	2
MD 006	First Aid	1	--	1
	Total	6	3	9

Table 11. Nonprofessional Courses

Course Code	Course Title	Credit Hours		
		Lect.	Pract./Tut	Total
MS 102	Mathematics	1	---	1
NP 303	Scientific Writing and communication skills	1	1	2
NP 705	Pharmaceutical Legislations and Regulatory Affairs	1	-	1
NP 906	Marketing & Pharmacoeconomics	2	--	2
NP 007	Entrepreneurship	1	1	2
NP 008	Professional Ethics	1	--	1
Total		7	2	9

4- مقررات اختيارية

Elective Courses:

The Faculty of Pharmacy offers elective courses from which the students are free to select eight credit hours.

Course Code	Course Title	Credit Hours		
		L	P/T	Total
PTE 1	Cosmetics	1	1	2
PTE2	Good Manufacturing Practice	1	1	2
PTE 3	Mass Production of Pharmaceutical Products	1	1	2
PTE 4	Total Quality Management	1	1	2
PGE 1	Plant Biotechnology	1	1	2
PGE 2	Production and Manufacture of Medicinal plants	1	1	2
PGE 3	Narcotics, Psychotropic and Toxic Plants	1	1	2
PGE 4	Nutraceutical and Herbal Drugs Interaction	1	1	2
POE1	Drug Abuse	1	1	2
POE2	Immunopharmacology	1	1	2
POE3	Pharmacogenetics	1	1	2
POE4	Screening and Biological Standardization	1	1	2
POE5	Veterinary Pharmacology	1	1	2
PCE1	Drug discovery	1	1	2
PCE2	Polymers	1	1	2
PCE3	Synthesis of Raw Materials	1	1	2

Course Code	Course Title	Credit Hours		
		L	P/T	Total
PCE4	Cosmetics Analysis	1	1	2
PCE5	Food Analysis	1	1	2
PCE6	Assessment of Food contaminant	1	1	2
PCE7	Green chemistry	1	1	2
PBE1	Introduction to Research Methodology	1	1	2
PBE2	Biotechnology and Human Disease	1	1	2
PBE3	Nutrition through life cycle	1	1	2
PBE4	Therapeutic Nutrition	1	1	2
PME1	Advanced Techniques in Microbiology and Immunology	1	1	2
PME2	Antimicrobial stewardship	1	1	2
PME3	Bioinformatics	1	1	2
PME4	Infection control	1	1	2
PME5	Marine microbiology	1	1	2
PPE1	Advanced Clinical Pharmacy	1	1	2
PPE2	Clinical Pharmacokinetics	1	1	2

L: Lecture
P: Practical
T: Tutorial

- لمجلس الكلية طرح المقررات الإختيارية من الامثلة المذكورة بالجدول السابق في كل مستوى/فصل دراسي وذلك بعد أخذ رأي مجالس الأقسام العلمية المختصة ويمكن للكلية إضافة مقررات إختيارية أخرى يشترط موافقة مجلس الجامعة بعد إبداء المبررات اللازمة.

مرفق رقم 2 خاص بالمادة رقم (18)

Programme Curriculum **الخطة الدراسية**

Table (1)

Semester (1)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Pharmaceutical Analytical Chemistry I	**PC 101**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Pharmaceutical Organic Chemistry I	**PC 102**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Pharmacy Orientation	**PT 101**	**1**	**-**	**1**	**Registration**	**10**	**--**	**30**	**10**	**50**	**1**
Medicinal Plants	**PG 101**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Medical Terminology	**MD 101**	**1**	**-**	**1**	**Registration**	**10**	**--**	**30**	**10**	**50**	**1**
Mathematics	**MS 102**	**1**	**---**	**1**	**Registration**	**10**	**--**	**30**	**10**	**50**	**1**
Total		**9**	**3**	**12**						**600**	

❍ ***Lect.*** = Lecture - ***Period.*** = Periodical -***Pract./ Tut.*** = Practical / Tutorial, ***Wr.*** = Written

Table (2)

Semester (2)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Pharmaceutical Analytical Chemistry II	PC 203	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutical Organic Chemistry II	PC 204	2	1	3	Registration	20	40	75	15	150	2
Cell Biology	PB 201	1	1	2	Registration	15	25	50	10	100	1
Anatomy	MD 202	1	1	2	Registration	15	25	50	10	100	1
Physical Pharmacy	PT 202	2	1	3	Registration	20	40	75	15	150	2
Pharmacognosy I	PG 202	2	1	3	Registration	20	40	75	15	150	2
Psychology	MD 203	1	-	1	Registration	10	--	30	10	50	1
Histology	MD 204	1	1	2	Registration	15	25	50	10	100	1
Total		12	7	19						950	

- *Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written*

Table (3)

Semester (3)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Pharmaceutical Analytical Chemistry III	**PC 305**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Pharmaceutical Organic Chemistry III	**PC 306**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Scientific writing and Communication skills	**NP 303**	**1**	**1**	**2**	**Registration**	**15**	**25**	**50**	**10**	**100**	**1**
Pharmacognosy II	**PG 303**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Physiology and Pathophysiology	**PO 304**	**2**	**-**	**2**	**Registration**	**25**	**-**	**60**	**15**	**100**	**2**
Pharmaceutics I	**PT 303**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Total		**11**	**5**	**16**						**800**	

- ***Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written***

Table (4)

Semester (4)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Biochemistry I	**PB 402**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
General Microbiology and Immunology	**PM 401**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Instrumental Analysis	**PC 407**	**2**	**1**	**3**	**Pharmaceutical Analytical Chemistry III**	**20**	**40**	**75**	**15**	**150**	**2**
Pathology	**MD 405**	**1**	**1**	**2**	**Histology**	**15**	**25**	**50**	**10**	**100**	**1**
Pharmaceutics II	**PT 404**	**2**	**1**	**3**	**Registration**	**20**	**40**	**75**	**15**	**150**	**2**
Biostatistics	**PO 401**	**1**	**-**	**1**	**Registration**	**10**	**--**	**30**	**10**	**50**	**1**
Total		**10**	**5**	**15**						**750**	

- ***Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written***

Table (5)

Semester (5)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Biochemistry II	PB 503	2	1	3	Biochemistry-I	20	40	75	15	150	2
Pharmaceutical Microbiology	PM 502	2	1	3	General Microbiology and Immunology	20	40	75	15	150	2
Phytochemistry I	PG 504	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutics III	PT 505	2	1	3	Registration	20	40	75	15	150	2
Medicinal Chemistry I	PC 508	2	1	3	Pharmaceutical organic III	20	40	75	15	150	2
Pharmacology I	PO 502	2	1	3	Physiology & Pathophysiology	20	40	75	15	150	2
Total		12	6	18						900	

- *Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written*

Table (6)

Semester (6)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Parasitology and Virology	PM 603	2	1	3	Registration	20	40	75	15	150	2
Biopharmaceutics and Pharmacokinetics	PT 606	2	1	3	Pharmaceutics I	20	40	75	15	150	2
Phytochemistry II	PG 605	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutics IV	PT 607	2	1	3	Registration	20	40	75	15	150	2
Pharmacology II	PO 603	2	1	3	Physiology & Pathophysiology	20	40	75	15	150	2
Medicinal Chemistry II	PC 609	2	1	3	Pharmaceutical Organic Chemistry III	20	40	75	15	150	2
Total		12	6	18						900	

- ***Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written***

Table (7)

Semester (7)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Medical Microbiology	PM 704	2	1	3	Pharmaceutical Microbiology	20	40	75	15	150	2
Pharmacology III	PO 704	2	1	3	Physiology & Pathophysiology	20	40	75	15	150	2
Applied & Forensic Pharmacognosy	PG 706	1	1	2	Registration	15	25	50	10	100	1
Medicinal chemistry III	PC 710	2	1	3	Pharmaceutical Organic Chemistry III	20	40	75	15	150	2
Clinical Biochemistry	PB 704	2	1	3	Biochemistry-II	20	40	75	15	150	2
Pharmaceutical Technology I	PT 708	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutical Legislations and Regulatory Affairs	NP 705	1	-	1	Registration	10	--	30	10	50	1
Elective	PE---	1	1	2	Registration	15	25	50	10	100	1
Total		13	7	20						1000	

- *Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written*

Table (8)

Semester (8)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Clinical Pharmacokinetics	PP 801	2	1	3	Biopharmaceutics and Pharmacokinetics	20	40	75	15	150	2
Drug Information	PO 805	1	1	2	Registration	15	25	50	10	100	1
Basic & Clinical Toxicology	PO 806	2	1	3	Pharmacology-III	20	40	75	15	150	2
Hospital Pharmacy	PP 802	1	1	2	Pharmacology II Pharmaceutics IV	15	25	50	10	100	1
Pharmaceutical Technology II	PT 809	2	1	3	Pharmaceutical Technology I	20	40	75	15	150	2
Community Pharmacy Practice	PP 803	2	1	3	Registration	20	40	75	15	150	2
Drug design	PC 801	2	1	3	Pharmaceutical Organic Chemistry III	20	40	75	15	150	2
Elective	PE ---	1	1	2	Registration	15	25	50	10	100	1
Total		13	8	21						1050	

- *Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written*

Table (9)

Semester (9)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Biotechnology	PM 905	2	1	3	Pharmaceutical Microbiology	20	40	75	15	150	2
Clinical pharmacy I	PP 904	2	1	3	Pharmacology-3	20	40	75	15	150	2
Public Health	PM 906	2	-	2	Medical Microbiology	25	---	75	---	100	2
Phytotherapy and Aromatherapy	PG 907	2	1	3	Phytochemistry-II	20	40	75	15	150	2
Good Manufacturing Practice	PT 910	1	1	2	Registration	15	25	50	10	100	1
Marketing & Pharmacoeconomics	NP 906	2	--	2	Registration	25	---	75	---	100	2
Human nutrition	PB 901	1	1	2	Clinical Biochemistry	15	25	50	10	100	1
Elective	PE ---	1	1	2	Registration	15	25	50	10	100	1
Total		13	6	19						950	

- *Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written*

Table (10)

Semester (10)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract./Tut	Total		Period.	Pract./Tut.	Wr.	Oral		
Quality Control of Pharmaceuticals	PC 011	2	1	3	Instrumental Analysis	20	40	75	15	150	2
First Aid	MD 006	1	--	1	Registration	10	--	30	10	50	1
Drug interaction	PP 005	1	1	2	Pharmacology-III	15	25	50	10	100	1
Advanced Drug Delivery Systems	PT 011	1	1	2	Pharmaceutics IV	15	25	50	10	100	1
Clinical Pharmacy II & Pharmacotherapeutics	PP 006	1	1	2	Clinical Pharmacy I	15	25	50	10	100	1
Entrepreneurship	NP 007	1	1	2	Registration	15	25	50	10	100	1
Clinical Research, Pharmacoepidemiology and & Pharmacovigilance	PP 007	1	1	2	Pharmacology-III	15	25	50	10	100	1
Professional Ethics	NP 008	1	--	1	Registration	10	--	30	10	50	1
Elective	PE ---	1	1	2	Registration	15	25	50	10	100	1
Total		10	7	17						850	

Lect. = Lecture - Period. = Periodical -Pract./ Tut. = Practical / Tutorial, Wr. = Written

مرفق 3

خاص بالمادة (19)

محتوى المقررات الدراسية

Course Content

PC 101 Pharmaceutical Analytical Chemistry I (2+1)

Chemical Kinetics, rate of reaction, first Order reaction, rate law , Second order and third order of reaction, molecularity , Chemical equilibrium, Theories of reaction rate, activation energy and catalysis , Photochemistry, absorbed energy, quantum yield and chemical equilibrium. Introduction to general chemistry, Types of chemical reactions – calculations of concentrations of substances. Analysis of anions – Analysis of cations – Analysis of mixture of anions and cations, gravimetry.

PC 102 Pharmaceutical Organic Chemistry I (2+1)

The objective of this course is to provide students with the basic knowledge in pharmaceutical organic chemistry, which will serve as fundamentals for other courses offered during subsequent semesters. This course involves Electronic structure of atom, alkanes [nomenclature, synthesis and reactions (free radical reactions)], and cycloakanes. Stereochemistry (Optical isomers, racemic modification, nomenclature of configurations). Alkenes, alkadienes and alkynes. Alkyl halides (nomenclature, preparation and chemical reactions (S_N1, S_N2, E_1, E_2). The practical sessions of this course help students gain skills required to purify and identify organic compounds of different classes such as aliphatic aldehydes, ketones alcohols and hydrocarbons, halogenated hydrocarbons.

PC 203 Pharmaceutical Analytical Chemistry II (2+1)

Acid-Base theory, titration curves, indicators, applications. Titrations in non aqueous media, classification of solvents, theory, applications. Precipitimetric titrations: solubility product principle, titration curves, Mohr's method. volhard's method, Fajans' method, pharmaceutical application. Complexometric reactions, theory, reaction with EDTA, indicators, applications.

PC 204 Pharmaceutical Organic Chemistry II (2+1)

This course involves different classes of aromatic organic compounds: Alcohols, Phenols, ethers & epoxides, aldehydes, ketones, carboxylic acid & acid derivatives, sulphonic acids, and nitrogenous compounds. Arenes and aromatic compounds (Kekule structure, Huckel rule, Electrophilic aromatic substitution and orientation). The practical sessions of this course help students gain skills required to purify and identify organic compounds of different classes such as aromatic aldehydes, ketones and alcohols.

PC 305 Pharmaceutical Analytical Chemistry III (2+1)

Redox titations, theory, oxidation potentials, Nernest equation, titration curves, redox indicators, selected oxidants and reductants, applications of redox titrations . The course also, covers applied pharmaceutical analysis such as water analysis (water hardness, analysis of chloride, chlorine, iron, oxidizable matter, … in water.

Electrochemical methods, electrode potential, reference electrodes, indicator electrode, applications. Conductomertric titration : ionic conductance, definition of cell constant, conductance, applications. polarography: ILkovic equation, dropping mercury electrodes, diffusion current, applications, derivatization polarography.

PC 306 Pharmaceutical Organic Chemistry III (2+1)

This course involves: carbohydrates, amino acid & peptides, polynuclear and heterocyclic chemistry. In addition, it provides an introduction about the use of different spectroscopic tools, including UV, infrared (IR), nuclear magnetic resonance (NMR) and mass spectrometry (MS) for the structural elucidation of organic compounds.

PC 407 Instrumental Analysis (2+1)

Spectroscopic methods of analysis which include uv/vis spectroscopy, principal, instrumentation, factors affecting absorption and applications in pharmaceutical analysis. Fluorimetric methods, principal instrumentation, factors affecting fluorescence intensity and applications in pharmaceutical analysis. Atomic spectroscopy; principal and instrumentation. Chromatographic methods for analytical chemistry which includes: TLC, gel chromatography, column chromatography, HPLC, UPLC, TLC, gas chromatography, capillary electrophoresis.

PC 508 Medicinal Chemistry I (2+1)

This course is tailored to handle different classes of antibiotics and antimicrobials (natural and synthetic), beside other synthetic chemotherapeutic agents (including antivirals, antifungals , antiparasitics and anti mycobacterial), also, the course will handle vitamins.

PC 609 Medicinal Chemistry II (2+1)

This course is tailored to assist the students to gain the drugs affecting the autonomic nervous system (ANS), drugs acting on the cardiovascular system (CVS), CNS and drugs affecting neurodegenerative disorders **.** Additionally, various anticancer therapies.

PC 710 Medicinal Chemistry III (2+1)

The course is tailored to assist the students to gain endocrine-related drugs (Diabetes, thyroid and calcium-regulating agents), antihistamines (H1, H2 blockers and anti-ulcer PPIs), drugs controlling pain and inflammation (NSAIDs, local anaesthetics and rheumatoid drugs)- steroidal hormones and related drugs, narcotic analgesic are also handled.

PC 801 Drug Design (2+1)

The prime objective of this course is to prepare the students for professional practice by understanding the essentials of Medicinal Chemistry, and how the drugs, biological and toxicological activities are strongly correlated to their chemical structures (Structure-activity relationship; SAR), physicochemical properties and metabolic pathways. Focusing on patient-directed clinical care, the molecular aspects governing drugs' pharmacokinetics (ADME), pharmacodynamics, optimization of drug action, possible side effects, in addition to understanding drug interactions are targeted. In terms of chemistry, SAR, mechanism of action and side effects. The course is also designed to familiarize the students with drug design and molecular modelling covering structure-based and ligand-based drug design. This also includes the process of drug discovery and development from target identification until approval of a new drug. Much concern is given to lead structure identification, optimization and targeting certain receptors and enzymes active sites. Additionally, the course addresses the study of molecular docking, pharmacophore

generation, and molecular modifications including prodrug design, stereochemistry alterations, isosteric replacement, drug metabolism and Quantitative Structure-activity relationship (QSAR).

PC 011 Quality Control of Pharmaceuticals (2+1)

This course will cover the followings:

I-Good Analytical Practice and Sampling: Introduction, Sampling of pharmaceuticals and related materials, Type of sampling tools, Sampling plans.

II-Documentation

III- Validation of analytical methods according to ICH Guidelines Q2 R1. Compendial testing , Validation of analytical methods, Data elements required for assay validation.

IV- drug stability, stability studies and stability indicating methods Drug stability, Stability testing , Forced degradation studies , stability indicating assay methods for drugs according to ICH Q1 R2 Guidelines. Stress conditions for drug degradation according to ICH Q1 R2 Guidelines. Factors affecting drug degradation, Drug expiration, Drug withdrawal from the market. Pharmaceutical regulations according to FDA & EMA (European medicine agency) and ISO and BSI. Drug-excipient interactions and adduct formation; analytical techniques used to detect drug-excipient compatibility, mechanism of drug-excipient interactions, examples.

V- Official methods of analysis applied to raw materials and end products.

PB 201 Cell Biology (1+1)

The cell theory and cell structure (membranous and non-membranous organelles - cell inclusions and the nucleus - macromolecules of the cell) - DNA and genetic code - Cell cycle and control of cell number – From gene to protein (transcription, protein synthesis, folding of peptides) – Transport of biomolecules across membranes – Cellular energetics - Ions and voltages – Intercellular communication.

PB 402 Biochemistry I (2+1)

Proteins (protein structure, biologically important peptides – fate of proteins) – Amino acids as precursors for biosynthesis of biomolecules (e.g. neurotransmitters, nucleotides, …)Carbohydrates (glycoproteins and proteoglycans - glucose transporters) – Lipids (physiologically important lipid molecules – cholesterol and steroids – lipoprotein metabolism) – Enzymology (enzyme kinetics – regulation – enzyme inhibitors as drugs) - Hemoglobin and porphyrins (Hb derivatives and types– metabolism of Hb and regulation) – Biological oxidation and ATP synthesis – Clinical correlations.

PB 503 Biochemistry II (2+1)

Energy production from dietary fuels (carbohydrates, lipids and proteins) –Integration of metabolism (Feed/fast cycle – diabetes mellitus – obesity) – Nitrogen metabolism and nitrogen balance – Hormonal regulation of metabolism – Biosignaling – Inborn errors of metabolism – Biochemistry of cancer - Biochemistry of aging – Food biochemistry (milk – probiotics) – Free radicals and antioxidants.

PB 704 Clinical Biochemistry (2+1)

Biochemical/pathophysiological changes and laboratory diagnostic markers for disorders of (Endocrine glands – renal function – hepatic function – gastric function – bone and mineral

metabolism - plasma proteins and lipoproteins) – Clinical enzymology and myocardial infarction - Electrolytes, blood gases and acid-base balance - Handling, preservation, storage and analysis of biological samples – Homeostasis and biochemical aspects of hematology and blood analysis – Urine analysis – Tumor markers - Recent diagnostic biomarkers.

PB 901: Human Nutrition

The course focuses on the kinds and amounts of macronutrients (carbohydrates, fat, and proteins) and micronutrients (vitamins and minerals) that are needed to maintain optimal health and prevent chronic disease in adults.

PG 101 Medicinal Plants (2+1)

The aim of the course is to provide students with knowledge necessary to identify and prepare a crude drug from the farm to the firm.Students should acquire knowledge concerning dusting powders, plant cytology, physiology and medicinal leafy plants and their taxonomy. In this course, the student will study: importance of natural products, preparation of natural products-derived drugs including collection, storage, preservation and adulteration. The course will introduce the students to the different classes of secondary metabolites. In addition, the course will discuss and address the variability in occurrence of pharmacologically active substances in certain official medicinal leafy plants according to their WHO monographs.

PG 202 Pharmacognosy I (2+1)

Based on the Egyptian flora and other florae of wild and cultivated medicinal plants that are used in the pharmaceutical, cosmetic and food industries in the global & Egyptian market.The course introduces students to some botanical drugs of leaves, flower, seeds, bark and wood origin. During the lectures and practical sessions, students learn to identify examples of these drugs in their entire and powdered forms. Student will learn about the major constituents, folk uses, clinically proven uses, benefits, precautions of those medicinal plants.possible herbal-drug interactions of selected examples of these drugs and to have an overview over their phytopharmaceuticals available on the market specially the Egyptian market.

PG 303 Pharmacognosy II (2+1)

After completion of the course the student should have the knowledge and skills that enable the student to differentiate between different organs of through their monographs. The course comprises the study of identification of different organs through their monographs. (fruits,herbs, Subterranean organs, unorganized drugs in addition to drugs of marine and animal origin) , including identify their active constituents and adulterants describe micro- and macro-morphological characteristics, benefits and precautions of their medicinal uses., side effects and contraindications and to have an overview over their phytopharmaceuticals available on the market specially the Egyptian market.

PG 504 Phytochemistry I (2+1)

Based on complementary medicine and Egyptian medicinal plants that can be used as natural extracts, bioactive raw materials and phytochemical standards to serve the pharmaceuticals, cosmetics and food industries in Egypt. The course aims to gain students the knowledge and skills

that enable them to understand, describe and deal with the chemistry of volatile oils, resins, miscellaneous terpenoids, bitters of plant or animal origin, carbohydrates and glycosides of plant or animal origin and different techniques used for their preparation, identification and determination. Also, the students should become aware of different chromatographicmethods used for isolation and analysis of different plant constituents and their pharmacological actions and medicinal uses.

PG 605 Phytochemistry II (2+1)

In continuation with Pharmacognosy I, this course aims to enable students to demonstrate the knowledge and experience that enables her/ him to understand, describe and deal with the chemistry of alkaloids, tannins and antioxidants of plant, fungi or animal origin as well as techniques for their isolation, identification and determination in their respective sources. Finally, the course focuses on the structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features.

PG 706 Applied & Forensic Pharmacognosy (1+1)

The course aims to provide pharmacy students with sufficient knowledge concerning quality control from herbal aspects,Sampling, structural, physical and analytical standards, purity, safety and adulteration of drugs and their detection. It also covers the modern chromatographic techniques employed for the evaluation of natural product and their products. It also provide the student with basic knowledge about the application of plant biotechnology for the production of pharmaceutically active materials.

The course also include an overview on forensic pharmacognosy including plants and their natural products that constitute health hazards, or intended for criminal uses to produce, abortion, loss of mental control, hallucination, heart arrest.. Also it includes the study of drug dependents, narcotics, analgesics psych energetics, euphoric. Mycotoxin as a serious threat to general health and safety of community, contamination of food material with poisonous fungi.

PG 907 Phytotherapy and Aromatherapy (2+1)

Upon successful completion of this course, the students should be able to know guidelines for prescribing herbal medicinal drugs on the basis of the pharmacological properties of these drugs including therapeutic uses, mechanism of action, dosage, adverse reactions, contraindications & drug interactions. The course also allows students understand pharmacotherapeutic principles applied to the treatment of different diseases, pharmacovigilance and rational use of drugs. Also the student should understand the basis of complementary and alternative medicine with emphasis on herbal remedies, nutritional supplements, homeopathies, aromatherapy & their effect on maintaining optimum health and prevention of chronic diseases.It includes studying of medicinal plants portfolios in relation to Phytopharmaceuticals in Egyptian Market.

PT 101 Pharmacy Orientation (1+0)

This is a course to acquaint the beginning pharmacy student with the multiple aspects of the profession of pharmacy, including the mission of pharmacy, role of pharmacist in society and pharmacy careers, classification of medications, interpretation of prescriptions and medication orders, general dispensing procedure and factors affecting drug dosage, sources of drugs, different

dosage forms and various routes of administration. In addition to the history of pharmacy practice in various civilizations

PT 202 Physical Pharmacy (2+1)

This course provides students with knowledge of physiccchemical principles essential for the design and formulation of pharmaceutical products. Students are introduced to the fundamental concepts of states of matter, Phase equilibrium, colligative properties, isotonicity solubility, dissolution, partition coefficient, surface and interfacial phenomena, surface active agents, adsorption and its application in pharmacy and rheological behaviour of dosage forms

PT 303 Pharmaceutics I (2+1)

This course is a study of the system of weights, measures, mathematical expertise and pharmaceutical calculations requisite to the compounding, dispensing, and utilization of drugs in pharmacy practice. It is also concerned with all manufacturing formulations aspects, packaging, storage and stability of liquid dosage forms including solutions (aqueous and non-aqueous), suspensions, emulsions and colloids with emphasis on the technology and pharmaceutical rationale fundamental to their design and development . The incompatibilities occurring during dispensing are also considered

PT 404 Pharmaceutics II (2+1)

This course covers the structure and function of the skin, target area of treatment after topical application to skin, basic principles of diffusion through membranes and factors affecting percutaneous absorption, enhancement of skin penetration, transdermal drug delivery systems (TDDS). It also describes the principles and techniques involved in the formulation and manufacturing of traditional dermatological semisolid dosage forms (creams, ointments, gels and pastes) and cosmetic products

PT 505 Pharmaceutics III (2+1)

The course introduces the students to the kinetics of drug decomposition including rate and order of the reaction, determination of the half-life, expiry date and shelf-life by different methods, stability testing, and in-vitro possible drug/excipients interactions . It also describes the principles and techniques involved in the formulation, and manufacturing of solid dosage forms including powders, granules, tablets, capsules and suppositories.

PT 606 Biopharmaceutics and Pharmacokinetics (2+1)

This course aims to provide students with an understanding of the relation between the physicochemical properties of the drug and its fate in the body. The course explores the principles of biopharmaceutics and strategies for enhancing drug delivery and bioavailability. Integration of knowledge gained from other courses is emphasized to design and assure the quality of drug products. Students will also be introduced to the principles of pharmacokinetics (absorption, distribution, metabolism and elimination). The concepts of bioequivalence, biowaivers and *in vitro-in vivo* correlations (IVIVC's) will be discussed along with different models of drug disposition. The course prepares students for their evolving role in utilizing pharmacokinetics to guide formulation, dosage-regimen design and optimizing drug usage.

PT 607 Pharmaceutics IV (2+1)

This course involves principles of formulation, development, sterilization, packaging and quality control testing of pharmaceutical sterile drug products. Principles for calculation and manipulation of parenterals, ophthalmic preparations, vaccines and blood products are emphasized. The course

also covers the basic principles of formulation, sterilization, packaging and applications of radiopharmaceuticals in pharmacy and medicine. An in depth study on the formulation, manufacturing, quality control testing and applications of aerosols and other inhalation products is also accentuated.

PT 708 Pharmaceutical Technology I (2+1)

The course provides students with an introduction to industrial pharmacy. It deals with the principles of various unit operations such as heat transfer, evaporation, drying, distillation, filtration, centrifugation, crystallization and extraction. It focuses on the application of these unit operations in pharmaceutical industry with emphasis on the equipment and machines used during the production of different dosage forms.

PT 809 Pharmaceutical Technology II (2+1)

This course is a continuation of the study of the various unit operations in pharmaceutical industry with emphasis on size reduction, size separation, size analysis and size enlargement involved in the process development, scale-up and manufacturing of pharmaceutical drug products in industry (conventional / advanced nanotechnology based). In addition to the container/closure systems, some of the packaging processing methods are covered. Moreover, the vision about designing a quality product and its manufacturing process to consistently deliver the intended performance of the product to meet patient needs is discussed by applying Quality-by-Design principles.

PT 910 Good Manufacturing Practice (1+1)

This course involves the principles of the Current Good Manufacturing Practices (cGMP). It exposes students to all aspects of validation, calibration, inspection and the requirements for manufacturing facilities. It also provides students with a review of the process engineering, technology transfer, personnel management, training and hygiene, premises and contamination control, documentation and auditing, process deviation with emphasis on risk management, complaint handling and product recall theory.

PT 011 Advanced Drug Delivery Systems (1+1)

The course aims to provide students with insights and competencies related to the principles of pharmaceutical pre-formulation as a gateway to dosage forms design and formulation . Emphasis is placed on developing formulations based on the physical and chemical properties of the drug substance and the intended use of the drug product. The course also introduces the students to the formulation principles and applications of novel and targeted drug delivery systems by transforming proteins, genes, and other biotechnology driven compounds into therapeutic products. In addition to formulation aspects of biotechnology derived pharmaceuticals, it also covers the application of polymers and excipients to solve problems/issues concerning the optimization of absorption, selective transport, and targeting.

PM 401 General Microbiology and Immunology (2+1)

The course provides students with a combination of laboratory and theoretical experience exploring the general aspects of microbiology. It includes knowledge of microorganisms, their morphology, diversity, cell structure and function, cultural characteristics, growth, metabolism, role of microorganisms in infectious diseases and microbial pathogenesis. It also clarifies different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria. The course also covers the principles of genetic characters including DNA and RNA structures, replication, different forms of mutation and mutagenic agents. It also explores the basic concepts microbial growth , cultivation and reproduction.

Moreover it introduces the modern concepts of medical immunology, with an emphasis onHost parasite relationship, Non-specific and specific immunity, Mechanism of protective immunity. Molecular and cellular immunology, including antigen and antibody structure, function and reaction between them, effector mechanisms, complement, and cell mediated immunity. Active and passive immunization. Hypersensitivity and in vitro antigen antibody reactions, Immuno-deficiency disorders, Autoimmunity and auto-immune disease, organ transplantation.

PM 502 Pharmaceutical Microbiology (2+1)

This course describes in detail the physical and chemical methods of bacterial eradication and how to effectively control microbial growth in the field of pharmaceutical industry / hospitals. It further describes the means of preservation of pharmaceutical products, as well as cosmetics, followed by the proper tests of quality control and sterility assurance. Sterilization, sterilization indicators, sterility testing, aseptic area, the microbiological quality of pharmaceuticals.Validation of sterilization process. Moreover, it explains the different groups of antimicrobials, their mechanism of action and resistance of microbes to biocides. Microbiological evaluation of antiseptics, disinfectants and preservatives.Antibiotics, classification and mechanism of action, Antiviral and antifungal agents, different classes of antibiotics including the new categories and new approaches to overcome bacterial resistance & antibiotics clinical abuse. Quality control & quality assurance of pharmaceuticals. Also, the **course** has to be designed for **quality control microbiology** professionals, **quality assurance** or regulatory affairs personnel who have responsibility for the performance of Bioburden, Endotoxin & Sterility Testing or for data review, pharmacists performing sterile compounding.Principles, methods and procedures of different quality control tests used for evaluation of safety, potency and palatability of pharmaceutical products of small and large molecules drugs (biologicals) including herbal drugs have to be taught. The standard pharmacopeial methods and procedures as well as international guidelines as WHO, EMA, TGA should be discussed.

PM 603 Parasitology and Virology (2 +1)

Part of this course will focus on parasitic infections of humans with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans. It concerns with different parasitological related diseases in in Egypt causing serious health problems.

This part of the course will discuss medical helminthology, protozoology and entomology concerning their morphological features, life cycle, pathogenesis, clinical manifestations, different diagnostic techniques, the most recent lines of treatment and prevention with control strategy for each parasitic infection. Moreover, it also cover laboratory diagnosis of human parasitic infections.

The other part of the course provides students with the essential knowledge to recognize the epidemiology, mechanisms of pathogenesis, clinical picture, methods of laboratory diagnosis, treatment, prevention and control measures of RNA and DNA viral infections in humans.

PM 704 Medical Microbiology (2+1)

The course aims at studying microorganisms causing infectious disease in human beings.The infectious diseases, their etiology and clinical manifestation, routes of transmission, treatment and techniques in detection and identification of pathogenic microorganismscaused by Gram positive

cocci& bacilli, Gram negative cocci& bacilli and mycobacteria of major significance to public health will be studied.

PM 905 Biotechnology (2+1)

The course aims to provide students withfundamentals, scope and applications in biotechnologythrough studyingfermentation technology, upstream, downstream, scaling up and down processes, use of molecular techniques for production of recombinant products and other major biotechnological products, biotransformation, bioremediation, bioleaching, bioinsecticides, biosurfactants and biopolymer production.

PM 906 Public Health (2+0)

This course aims at understanding all scientific disciplines required for health education and promotion directed to the community health. How epidemiology acts as the bases of public health actions will be taught. Detailed scientific information and practices programs will be provided for control of communicable, non-communicable diseases, improving mental, social, environmental, occupational, geriatric and family health, use of sufficient and balanced food and nutrition, supplying safe drinking water, treating and disposing wastes and proper intervention during disasters

PO 401 Biostatistics (1+0)

This course provides basic concepts of biostatistics and data analysis.
It includes introduction to descriptive and inferential statistics, interpretation of estimates, confidence intervals and significance tests, elementary concepts of probability and sampling; binomial and normal distribution, basic concepts of hypothesis testing, estimation and confidence intervals, t-test and chi-square test, linear regression theory and the analysis of variance.

PO 304 Physiology and Pathophysiology (2+0)

Physiology
Introduction to body water, homeostasis, transport of materials, nervous systems, neuron structure and function (reflex arc), cardiovascular system, blood, respiratory cycle, gastrointestinal, reproductive, and renal systems, endocrine glands and body temperature regulation.
Pathophysiology
Introduction to pathophysiology, cell injury, inflammation and immune response, autonomic nervous system in health and disease, endocrine disorders, pancreatic disorders, fluid and electrolyte imbalance, vascular and hematological disorders, disease of urinary, pulmonary and digestive systems.

PO 502 Pharmacology-I (2+1)

The general principles of pharmacology are presented; such as pharmacokinetics,
pharmacodynamics, receptor theory, drug interaction and principle of therapeutics
This course integrates principles of pharmacology with conceptual knowledge of physiology and pathophysiology to disease processes regarding the autonomic, neuromuscular and autacoids.

PO 603 Pharmacology-II (2+1)

This course integrates principles of pharmacology with conceptual knowledge of physiology and pathophysiology disease processes regarding drugs acting on cardiovascular systems, central

nervous system, gastro-intestinal tract , pulmonary systems and hematologic disorders. Antihyperlipidemic drugs are also included.

PO 704 Pharmacology-III (2+1)

This course integrates principles of pharmacology with conceptual knowledge of physiology and pathophysiology disease processes regarding drugs acting on endocrine system. Chemotherapeutic drugs including antimicrobials, anticancer and immunosuppressant are within the scope of the course. Stem cell therapy is also included. The anti-inflammatory, analgesics as well as gout treatments are also included.

PO 705 Drug Information (1+1)

This course introduces the student to the concept and need of drug information, types of drug information resources (primary, secondary and tertiary literature), computerized and online drug information, literature evaluation and critical appraisal, retrieval of information. It also aims at providing the students with the professional skills required to effectively and accurately answer medication- related questions in a systematic and evidence based approach.

PO 806 Toxicology & Forensic Chemistry (2+1)

This course provides basics and concepts of toxicology including the mechanism of toxicity, target organ and treatment of toxicity.Toxic groups including heavy metals, toxic gases, animal, plant and marine poisons, pesticides and radiation hazards are covered. Environmental, occupational, reproductive and genetic toxicology as well as drug abuse are included. Postmortem sampling for detection of poisons, methods of detection, interpretation of results and writing of a report are also covered.

MD 101 Medical Terminology (1+0)

Introduction to medical and pharmaceutical terminologies, medical abbreviations, medical idioms, suffixes and prefixes, medical terms pertaining to major body systems.

MD 202 Anatomy (1 +1)

The aim of the course is to provide the students with competency concerning the appropriate functions of cells, tissues, organs and body system. The course also enables the student to integrate physiological data and mechanisms with ongoing taught sciences: anatomy. The course includes introduction to human anatomy, tissues of the body, skeletal system, articular system, muscular system, digestive system, cardiovascular, respiratory system, lymphatic system, urinary system, genital system, nervous and endocrine systems.

MD 203 Psychology (1+0)

The course introduces different principles, theories and vocabulary of psychology as a science. The course also aims to provide students with basic concepts of social psychology, medical sociology and interpersonal communication which relate to the pharmacy practice system that involves patients, pharmacists, physicians, nurses and other health care professionals.

MD 204 Histology (1 +1)

The aim of the course is to provide the students with competency concerning the appropriate functions of cells, tissues, organs and body system. The course also enables the student to integrate

physiological data and mechanisms with ongoing taught sciences: histology. Histology part includes cytology, epithelium, C.T., blood, muscle, vascular, lymphatic, respiratory, gastrointestinal and endocrine systems.

MD 405 Pathology (1+1)

The main aim of Pathology course is to provide the second year student with knowledge and skills for common diseases affecting body organs and system. It helps the student to understand the causes **(etiology)** of disease, the mechanisms of its development **(pathogenesis)** and the associated alterations of structure **(morphologic changes)** and function **(clinical manifestations and complications)** to be able to **determine the most likely diagnosis** of the disease.

MD 006 First Aid (1+0)

The course covers topics of basic life support and medical emergency of different situations including bleeding, shock, poisoning, bone fractures, soft tissue injuries, rescue and transportation. It includes: introduction to first aid ABCs, medical emergencies, effect of temperature, transportation of an injured casualty & first aid kit, respiratory emergencies, fractures and dislocations, bleeding and surgical emergencies, burns and scalds, animal bites or stings and poisoning.

PP 801 Clinical Pharmacokinetics (2+1)

This course provides basic principles of pharmacokinetics and their application to the clinical setting. Single Intravenous bolus and oral kinetics, IV infusion, multiple IV bolus, short infusion &oral dosing, non-linear pharmacokinetics, pharmacokinetic models. Sources of variability in pharmacokinetics, dosage regimen and dosage adjustment in children, obese, elderly patients and chronic disease states.Therapeutic drug monitoring and pharmacogenomics approaches.

PP 802 Hospital Pharmacy(1+1)

The course aims to introduces students to hospital pharmacy organization, structure, management and related activities on both technical and administrative levels in accordance with national and international established guidelines. Administrative services include: the pharmacy, the pharmacy and therapeutic committee and policy making, the hospital formulary, medication purchasing, distribution and dispensing systems. The pharmaceutical (technical) services include: preparation of Intravenous (IV) admixtures, total parenteral nutrition (TPN) fluids, renal dialysis fluids, dispensing and safe handling of radiopharmaceuticals, cytotoxic drugs, and medical gases.

PP 803 Community Pharmacy Practice (2+1)

The course provides students with competencies and knowledge for the provision of quality pharmaceutical care in a community pharmacy setting aiming at improving use of medicines and therapeutic outcomes. The course covers differentiation between minor and major ailments and responding to minor ailments with over-the-counter products. It also provides concepts of patient assessment, counselling, and monitoring in community pharmacy and in outpatient care settings and introduces students to pharmaceutical care services for chronic-diseased outpatients and to psychosocial aspects in patient care. In addition, the course provides the students with competencies to promote the public health role of pharmacist including health promotion and disease prevention activities

PP 904 Clinical Pharmacy I (2+1)

Definition and concepts of clinical pharmacy and pharmaceutical care, and qualification to become a clinical pharmacy.Patient history, medication reconciliation, therapeutic planning and drug-related problems. Interpretation of clinical laboratory data and physical examination. Providing Medication

Therapy management services. Principles of special care populations (geriatric, pediatric, renal and hepatic patients, obesity &pregnancy& lactation). The course also introduces the student to the principles of management and supportive care of oncological diseases,blood disorders and nutritional deficiencies.

PP 005 Drug interaction (1+1)

The course is shared between 2 departments : Pharmacology & Pharmacy Practice

This course provides the knowledge and skills enabling them to develop professional competencies in the recognition and discussion of the pharmacological aspects of drug-drug, drug-chemical, drug-herb or drug-food interactions and their clinical significance as well as the application of that knowledge to minimize the risk and outcome of interactions.

It covers different types of drug interaction including pharmaceutical interactions, pharmacokinetic interactions, pharmacodynamic interactions, herbal & food drug interactions, alcohol and smoking drug interactions, CNS drug interactions, interactions of cardiovascular acting drugs, interactions of anticoagulants, interactions of anti-infectives, interactions of antihistaminics& immune-based therapies,interactions of hormones, and drug-disease interactions.

The course is designed to familiarize students with the major types of drug interactions (Pharmacokinetic, pharmacodynamic and pharmacogentic interactions) in the clinical setting, in addition to drug food and drug disease interactions. The course compromises digitalis drug interactions, anticoagulants, hypoglycemic interactions, antineoplastic drug interactions, antihypertensive interactions and anticonvulsant Interactions. Students will be expected to determine whether a given interaction is clinically significant or required pharmacist intervention, make rational, scientifically recommendations for management of drug interactions.

PP 006 Clinical Pharmacy II & Pharmacotherapeutics(1+1)

The course introduces the student to the principles of pharmacotherapeutics & management of the common disease states (e.g. cardiovascular diseases, gastrointestinal diseases, respiratory diseases, endocrine diseases, obstetrics and gynecology, rheumatic diseases, renal diseases, CNS diseases).

PP 007 Clinical research, Pharmacoepidemiology and Pharmacovigilance(1+1)

This course introduces the student to the basic principles of clinical research, design of research studies, types of research studies, clinical trials, statistical presentation of research data and ethical guidelines in drug research. This course addresses a range of study designs and analytic techniques for observational studies on the utilization, safety, and effectiveness of pharmaceuticals. Students will develop an understanding of how to plan, implement, analyse, and criticize pharmacoepidemiological studies. This course also provides the student's with understanding of pharmacovigilance importance, concept, processes, systems, global safety standards and regulations and reporting systems

MS 102 Mathematics (1+0)

Functions and graphs, limits and continuity, differentiation, exponential, logarithmic, and trigonometric functions, integration, basic differential equations, functions of several variables and problems related to them, probability and random variables, and hypothesis testing.

NP 303 Scientific Writing and Communication skills (1 + 1)

This course is designed to introduce students to the principles of good scientific writing, to be familiar with basic structure of scientific reports and research articles. It covers methods of paraphrasing, common mistakes in scientific writing, different writing styles, how to write a scientific report, proposal and manuscript, appropriate use of tables and figures in data presentation and evaluation of literature and information sources. In addition it will help students develop necessary written and oral communication and presentation skills to improve inter- and intra-professional collaboration and communication with patients and other health care providers. The

course will also deal with the underlying attitudes, which form an interpersonal skills. It focuses on concept and meaning of communication; verbal and non verbal communication (body and vocal language); active listening skills; communication styles and presentation skills. Communication skills in diverse pharmacy practice setting will be discussed.

NP 705 Pharmaceutical Legislations and Regulatory Affairs (1+0)

A detailed presentation of law that governs and affects the practice of pharmacy, legal principles for non-controlled and controlled prescriptions, OTC drug requirements, opening new pharmacies, opening medical stores, opening factories, opening scientific offices, medicine registration, pharmacies and medicine stores management. Pharmacist duties and responsibilities, pharmacist-patient relationship, patient's rights and ethical principles and moral rules.

NP 906 Marketing & Pharmacoeconomics (2 + 0)

Pharmacoeconomics

the basic concepts of health economics, learning basic terms of health economics and understand key principles. Topics cover the economic mechanisms of health care markets as market failures, and government intervention. The course covers the key components of health care financing, and some methods of how to contain health care expenditure. Alongside the major definitions in health technology assessment, students should have an overview about different types of economic evaluation, budget impact analysis and their uses. Moreover, students should get familiar with different methods of pricing among which value-based pricing.

Marketing

The objective of this course is to introduce students to the concepts, analyses, and activities that comprise marketing management, and to provide practice in assessing and solving marketing problems. The course is also a foundation for advanced electives in Marketing as well as other business/social disciplines. Topics include marketing strategy, customer behavior, segmentation, market research, product management, pricing, promotion, sales force management and competitive analysis.

NP 907 Entrepreneurship (1+1)

This course is designed to enhance a student's knowledge in leadership, business, and financial skills in pharmacy practice while learning the traits of an entrepreneur, current topics in entrepreneurship with a specific focus on pharmacy practice and patient care programs. This course will teach the participants a comprehensive set of critical skills needed to develop a profitable business project. This course is designed to provide the students the personal and business tools including risk-taking, strategic planning, marketing, competitiveness, and social responsibility to make the transition from the academic environment to the daily practice of pharmacy now and in the future, with an emphasis on entrepreneurship.

NP 007 Professional Ethics (1 + 0)

Professional ethics provides general principles and history of pharmacy ethics, general principles of medical ethics, conflicts of interests and its management pharmacists relationship with society and family, ethics in disaster, medication error, research ethics and animal ethics.

Elective courses

PTE 1:Cosmetics (1+1)

The course aims to provide the students with the necessary knowledge and skills of the manufacture of cosmetics for hair and skin. It includes the difference between drugs, cosmeceuticals and

cosmetics, different skin types, effects of age, race, sex and age on skin characters, Baumann skin type indicator, UV filters, after sun care products and tanning agents, skin whitening agents, anti-cellulite products, decorative products as face powders, blushers, eye cosmetics and foundations, as well as their main ingredients and specification of colors used for their preparation, seawater salts: their composition and their anti-inflammatory action, antiperspirants and deodorants: their main components and mechanism of action, hair structure, hair conditioners: their composition and effect on health and beauty of hair, preparation of aromatic waters, preparation of soaps and soap bases and preparation of cosmetic creams and gels.

PTE2 Good Manufacturing Practice (1+1)

This course involves the principles of the Current Good Manufacturing Practices (cGMP). It exposes students to all aspects of validation, calibration, inspection and the requirements for manufacturing facilities. It also provides students with a review of the process engineering, technology transfer, personnel management, training and hygiene, premises and contamination control, documentation and auditing, process deviation with emphasis on risk management, complaint handling and product recall theory.

PTE 3 Mass Production of Pharmaceutical Products (1+1)

The course aims at informing the students with the problems that arise when manufacturing pharmaceuticals on a large scale, what are these problems, and how to solve them. It includes problems evolved during transfer of the formula from laboratory scale to industrial scale, how to solve different problems of scaling up- case study, packs and packaging techniques, design of facility utility, mechanical systems, heating, ventilation-air conditioning systems, fire protection systems, piping systems, purified water station, vacuum and process gases.

PTE 4 Total Quality Management (1+1)

The course aims at clarifying the practices of management, control and documentation of quality within pharmaceutical manufacturing establishments. It includes quality, quality control, quality management, process control, material control, basic requirements for pharmaceutical quality management, total quality management. quality costs, manufacturing quality management, documentation, sanitation procedures including food safety, drugs, microbes, allergens, GMP, staff, pest control, plant construction, design, sanitary facilities, cleaning and sterilization.

PGE 1 Plant Biotechnology (1+1)

The course aims to introduce the principles of tissue culture, plant cells, types, factors and techniques used. It includes introduction to plant tissue culture- advantage and disadvantage, plant cell culture media composition and preparation, factors affecting secondary metabolite production (media formulation, agitation, temperature,…), plant growth regulators, culture types (callus, suspension, embryo, protoplast,..), plant explants and sterilization, callus culture and induction, *In vitro* shoot proliferation, *In vitro* root formation and acclimatization, plant regeneration, somatic embryogenesis, RAPD analysis for genetic assessment, elicitation, characteristics of elicitors and classification of elicitors and their mechanism of actions.

PGE 2 Production and Manufacture of Medicinal plants (1+1)

The course aims to introduce the students to the chemical composition of compounds separated from natural sources and different techniques of their separation. It includes the study of the interaction of electromagnetic radiation with matter, different spectroscopic methods used in structure elucidation of compounds isolated from natural sources. In each method; terminology, principle, instrumentation and application are illustrated. In ultraviolet spectrophotometry (UV); electron transitions are used to determine bonding patterns and determine ring structures. In Infrared spectrophotometry (IR); bond vibration frequencies in a molecule are used to determine the functional group. Nuclear magnetic resonance (1H and 13CNMR) detects signals from H or C atoms and can be used to elucidate the molecular structure of known or new compounds through chemical shift, multiplicity, coupling constant and integration. Mass spectrometry is used to measure the mass of the unknown compounds based on the mass-to-charge (m/z) ratio of the molecular ion and its fragments.

PGE 3 Narcotics, Psychotropic and Toxic Plants (1+1)

Interpretation of the difference between the narcotic drugs from natural source based on their potential for abuse, existing medicinal use as well as safety assessments and analytical detection and quantification in biological samples.

PGE 3 Marine Natural Products (1+1)

Detailed study of biologically active agents from marine organisms; chemistry, preparation and pharmaceutical uses.

PGE 4 Nutraceutical and Herbal Drugs Interaction (1+1)

Devoted to food or food products that provide health and medical benefits, including the prevention and treatment of disease. Such products may range from isolated nutrients, dietary supplements and specific diets to genetically engineered foods and herbal products.

POE1 Drug Abuse (1+1)

The course aims to provide students with a comprehensive overview of the drugs and chemicals that are commonly being abused or misused in our society. It includes the classes of drug and short-term and long-term effects of each class of drug, short-term and long-term effects of the drugs, as well as treatment strategies and principles for prevention. The course also discusses the common methods of administration, the speed of transmission to the brain and the neurological impact on the brain as well as treatment strategies and principles for prevention.

POE2 Immunopharmacology (1+1)

The course aims to cover the basics of immunology and its relevance for human disease and how to deal with it, and drugs that are linked to the immune system. It includes the structure and function of the immune system, systematic coverage of drugs affecting the immune system (immunostimulants, immunosuppressants), immunotoxicology including types of allergic reactions, management of allergy, management of inflammation, management of organ transplantation and tests for allergy, autoimmune diseases and immunodiagnostics using molecular techniques.

POE3 Pharmacogenetics (1+1)

The course aims to provide students with the principles and applications of human genetics and genomics in drug therapy optimization, patient care, and counseling. It includes introduction to pharmacogenetics, gene structure and function, organization of human genome, mutation nature and

types, mutagenic diseases, molecular lesions and genetic disorders, types of genetic disorders, treatment plans for genetic diseases, relation between immunology and pharmacogenetics.

POE4 Screening and Biological Standardization (1+1)

The course covers different procedures applied for screening of pharmacological activity of new compounds. The course includes screening of autonomic acting drugs, drugs acting on the cardiovascular system, drugs affecting the central nervous system, anti-inflammatory drugs, analgesics (narcotics and non-narcotics), anti-ulcer drugs as well as hormones.

POE5 Veterinary Pharmacology (1+1)

The commonly used veterinary biological and pharmaceutical preparations; general sanitary and management procedures for the prevention and control of livestock diseases; a brief review of infectious diseases and animal parasites.

PCE1 Drug discovery (1+1)

The course aims to provide the students with the necessary knowledge and skills concerning methods of discovery and composition of different drugs. It includes different synthetic pathway of drugs, characters, advantages and disadvantages and application of each way.

PCE2 Polymers (1+1)

The course aims to provide the student with the necessary knowledge about polymers and their types and industrial applications, especially in the field of pharmaceutical manufacturing. It includes introduction to synthetic and biological polymers methods for making polymers, introduction to addition, or chain-growth, polymers, free radical polymerization, cationic polymerization, anionic, polymerization, introduction to condensation, or step-growth, polymers, polyamides, polyesters, polycarbonates, polyurethanes and applications in pharmaceutical industry.

PCE 3 Synthesis of Raw Materials

The course aims to study strategies for the formation of raw materials and organic compounds. It includes applying retrorosynthetic strategies in synthesis of raw materials including definition of disconnection, FGI (functional group interconversion), synthon and reagent, synthetic strategies and tactics, 2-group disconnections, synthetic strategies for 1,4-difunctionalised compounds, cyclic systems, cycloaddition and reconnection strategies. It also includes case studies of most common active principles like paracetamol, ibuprofen …..etc (mini and mass scale).

PCE 4 Cosmetics Analysis (1+1)

The course aims to introduce how cosmetics are analyzed with their various components. It includes classification of cosmetics, additives, preservatives, coloring matter, degradation of coloring matter, sampling analysis of preservatives, analysis of coloring matter and analysis of heavy metals.

PCE 5 Food Analysis (1+1)

The course aims to provide the student with the necessary knowledge and skills concerning the techniques of food analysis and its various components. It includes sampling techniques, calculation of the energy content of foods, determination of moisture and solids, analytical methods of food

lipid, analysis of food carbohydrate, analysis of fiber, analysis of proteins, analysis of vitamin, trace element analysis and elemental analysis.

PCE 6 Assessment of Food contaminant (1+1)

The course aims at providing the students with the knowledge and skills related to assessment of safe food definition - food chemical residues - food biological residues - radiological residues - contamination of particular foods.

PCE 7 Green chemistry (1+1)

This course is designed to includes introduction about green chemistry, principles of green chemistry (prevention, atom economy, less hazardous chemicals synthesis, designing safer chemicals, designing safer chemicals, safer solvents and auxiliaries, design for energy efficiency, use of renewable feed stocks, reduce derivatives, catalysis, design for degradation, real-time analysis for pollution prevention, inherently safer chemistry for accident prevention)- green analytical chemistry- application of green methods in pharmaceutical analysis.

PBE1 Introduction to Research Methodology (1+1)

The course aims to provide the student who hope to pursue careers in scientific research with the necessary knowledge and skills related to the scientific research methods and its various stages and controls. It includes research methodology by concentrating on the foundations of scientific research and educating students on multiple methods of tackling research points, how to conduct literature surveys, experimental design, data collection and statistical analysis and time management.

PBE2 Biotechnology and Human Disease (1+1)

The course aims to provide the students with the necessary knowledge and skills concerning the most important biotechnology techniques related to the diagnosis and understanding of human genetic diseases. It includes understand of genes and their expression, possible several techniques that contributed to our understanding of many genetic disease, the discovery of restriction endonucleases as well as the development of cloning techniques, providing a mechanism for amplification of specific nucleotide sequences. It also includes the ability to synthesize specific probes, which has allowed the identification and manipulation of nucleotide sequences of interest. These and other experimental approaches have permitted the identification of both normal and mutant nucleotide sequences in DNA.

PBE3 Nutrition through life cycle (1+1)

The course aims at providing the students with the knowledge and skills related to balanced diet and principle of meal planning - functions and deficiency of micro nutrients (vitamins, minerals, and antioxidants) - and dietary supplement - nutrition during pregnancy and lactation - nutrition during infancy, preschool , school age and adolescence - growth and development during different stages of life cycle - growth and development during different stages of life cycle - nutrition for adults and elderly.

PBE4 Therapeutic Nutrition (1+1)

The course aims at providing the students with the knowledge and skills related to Effects of Drugs on Appetite- Effects of Drugs on Food Absorption, and Metabolism - Drug affecting food kinetics - Possible Effects of Drugs on Mineral and Vitamin Metabolism - GIT diseases : Nutritional back

grounds , Nutraceuticals and Drug interaction (Liver diseases: - Renal diseases: CNS and peripheral nervous systems diseases- respiratory diseases-GIT diseases - cardiovascular system-endocrine system diseases).

PME1 Advanced Techniques in Microbiology and Immunology (1+1)

The course aims to provide the students with the necessary knowledge and skills of modern techniques used in microbiological and immunological studies and their applications. It includes principles and applications of advanced microbiological and immunological techniques including mass spectrometry, flow cytometry, fluorescence imaging, pulsed field gel electrophoresis, Southern blot and Northern blot.

PME2 Antimicrobial stewardship

Factors affecting choice of antimicrobial agent, types of antimicrobial compounds, types of antibiotics and synthetic antimicrobial agents, clinical uses of antimicrobial drugs, manufacturing of antibiotics and other synthetic antimicrobial agents, principle methods of assaying antibiotics, mechanism of action antibiotics, bacterial resistance.

PME3 Bioinformatics

The course aims to introduce the students to the databases of nuclear acids and proteins and how to use them, and the applications of bioinformatics in the fields of industry and scientific research. It includes sequencing technology and next generation sequencing, overview of various primary and secondary databases of protein and nucleic acid, sequence comparison methods, use of sequences to determine phylogenetic relationship, database search algorithms and applications in pharmaceuticals industry.

PME4 Infection control (1+1)

Course includes infection prevention and control practices, the chain of infection, standard and transmission-based precautions, barriers and use of personal protective equipment (PPE), and strategies for preventing the spread of infectious disease to healthcare workers and patients.

PME5 Marine microbiology (1+1)

This course aimed to understand microbiology of marine environment with special emphasis on microbiological ecology, taxonomy, nutrient cycle, food microbiology and microbial biodegradation.

PPE1 Advanced Clinical Pharmacy

Clinical pharmacy in obstetrics, gynecology, neonates, pediatrics, geriatrics, blood disease and CNS disease. Nutritional deficiencies, energy and nutritional needs, enteral and parenteral nutrition.

PPE2 Clinical Pharmacokinetics

Introduction, applied clinical pharmacokinetics, therapeutic drug monitoring, mono and multi-exponential pharmacokinetics, Non-compartmental pharmacokinetics and moment analysis. Drug distribution and drug clearance mechanisms, IV infusion kinetics and kinetics following extra-vascular dosing, metabolite kinetics, multiple dose kinetics, nonlinear pharmacokinetics, dosage regimen design, dosage individualization of drugs of low therapeutic index, especially in patients with compromised renal and hepatic function.