



اللائحة الداخلية

لبرنامج

بكالوريوس الصيدلة فارم دي

**Pharm D**

طبقا لنظام الساعات المعتمدة

(يونيو - 2019)

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## رؤية و رسالة و أهداف كلية الصيدلة - جامعة بني سويف

### الرؤية:

تسعى كلية الصيدلة جامعة بني سويف أن تكون رائدة و متميزة في مجال العلوم الصيدلانية إستنادا لبرامجها التعليمية و أنشطتها البحثية و خدماتها المجتمعية.

### الرسالة:

تعمل كلية صيدلة جامعة بني سويف على إعداد كوادر علمية و بحثية مؤهلة في مجال العلوم الصيدلانية و الإكلينيكية لخدمة المجتمع و تلبية إحتياجات سوق العمل من خلال إعداد بنية أساسية و معرفية و مهارية لجعلهم قادرين على المنافسة محليا و إقليميا و مواكبة المستجدات العلمية و التكنولوجية.

### أهداف الكلية:

١. التنمية المستمرة للموارد المادية للكلية و تحسين الوضع التنافسي للمؤسسة
٢. تنمية و تطوير مهارات و كفاءه الموارد البشرية
٣. دعم منظومة التعليم بالكلية
٤. دعم منظومة البحث العلمي
٥. دعم الطلاب و غرس روح الابتكار و ريادة الاعمال
٦. دعم دور الكلية في تنمية البيئة المحيطة و الارتقاء بالمجتمع و فتح قنوات اتصال مع الجهات المستفيدة من هيئات و مصانع و مستشفيات و غيرها.

### الأقسام العلمية:

١. الصيدلانيات و الصيدلة الصناعية .
٢. العقاقير
٣. الأدوية و السموم
٤. الميكروبيولوجيا الصيدلانية و المناعة
٥. الكيمياء العضوية الصيدلانية
٦. الكيمياء التحليلية الصيدلانية
٧. الكيمياء الحيوية .
٨. الكيمياء الدوائية
٩. الصيدلة الإكلينيكية

## 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 الصيدلانية والرعاية العلاجية التي تمكنهم المساهمة في تطوير الصناعات الدوائية و رفع كفاءة منظومة الرعاية الصيدلانية على المستوى المحلي والإقليمي في المستشفيات و الصيدليات الاهلية من خلال تقديم الخدمات الصيدلانية 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 صيدلي يستخدم البيانات التي تستند على الدلائل لتقديم المستحضرات الصيدلانية المعاصرة والخدمات الصيدلانية 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 درجة بكالوريوس الصيدلة فارم دي (Pharm D) طبقاً لنظام الساعات المعتمدة.

## مادة (3):

### التأهيل للدرجات الأكاديمية الأعلى:

درجة بكالوريوس الصيدلة فارم دي هي الدرجة الجامعية الأولى في مجال الصيدلة اللازمة للحصول على ترخيص ممارسة المهنة في جميع المجالات الصيدلانية المتاحة ، كما تؤهل الخريج للتسجيل لدرجة الماجستير في أي من الأقسام العلمية في الكلية.

## مادة (4):

### نظام الدراسة

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

ينقسم كل مستوى (عام) دراسي إلى فصلين دراسيين (الخريف والربيع) ومدة كل فصل دراسي خمسة عشر أسبوعاً. 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:

أولاً : عدد الساعات المعتمدة لا يزيد عن 175 ساعة معتمدة و لا يقل عن 170 ساعة معتمدة، بالإضافة إلى متطلبات الجامعة بحد أقصى 6 ساعات معتمدة.

ثانياً : ألا تقل عدد المقررات الاختيارية عن أربعة مقررات (8 ساعات معتمدة) يتم اختيارها من القائمة التي تحددها الكلية. هذا بالإضافة إلى 100 ساعة تدريب صيفي فعلية يبدأ بنهاية المستوى الثالث و قبل البدء في سنة الامتياز.

ثالثاً : أن تقوم الكليات بوضع مواصفات ومحتوى المقررات الدراسية ( Course description & content) من خلال الأقسام العلمية وتقوم لجنة القطاع بتشكيل لجان من الخبراء المتخصصين لمراجعة اللوائح و التأكد من انها تحقق مواصفات الخريج.

رابعاً : يمكن للكلية عمل تغيير بالحذف والإضافة في المقررات المقترحة بما لا يزيد عن 15% وبما لا يتسبب في زيادة اجمالي عدد الساعات المعتمدة المقررة للتخرج (175 ساعة معتمدة) ولا يقل عن 170 ساعة معتمدة بالإضافة إلى متطلبات الجامعة بحد أقصى 6 ساعات معتمدة ، بما يحافظ على تحقيق المعايير الأكاديمية القومية المرجعية 2017 NARS.

خامساً: يمكن للكلية عمل تعديل بالحذف والإضافة في توصيف المقررات بما لا يزيد عن 20% من المحتوى العلمي للمقرر وبما يحقق إضافة وتحديث ضروري.

سادسا : المقررات الاختيارية للطالب في المستويين الآخرين يفضل ان تحقق له جدارات و مهارات تساعده على التوجه المهني والتخصص. وأن يكون أحد المقررات الاختيارية في إحدى 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 الشؤون العلمية والاجتماعية 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 للمتاح للطالب عن 12 ساعة معتمدة (أنظر التالي – فقرة أ – العبء الدراسي)، أو إذا كان تخرجه يتوقف على ذلك، 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.

وينبغي 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) العبء الدراسي :

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 وعلى الا يزيد العبء الدراسي للطالب المتعثر (المعدل التراكمي أقل من 1) عن 12 ساعة معتمدة (أنظر مادة 13) .

العبء الدراسي خلال الفصل الصيفي بحد أقصى 10 ساعات معتمدة. ويجوز لمجلس الكلية السماح للطلاب في آخر 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 للطلاب المتعثر (أنظر مادة 13 - التعثر الأكاديمي) بزيادة العبء الدراسي عن الحد الأقصى خلال الفصل الصيفي وبما لا يتجاوز عدد 2 ساعة معتمدة.

#### (ب) الإضافة والحذف والانسحاب :

يجوز للطلاب بعد إكمال إجراءات التسجيل أن يضيف أو يحذف إلى ساعاته المعتمدة مقررًا أو أكثر في أي فصل دراسي على أن يكون ذلك في خلال الفترات المحددة حسب الأجنحة الدراسية المعلنة لكل فصل دراسي، ويكون ذلك خلال أسبوع من نهاية التسجيل، مع مراعاة الحد الأدنى والحد الأقصى للعبء الدراسي. كما يجوز للطلاب بعد تسجيله الانسحاب 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، وذلك قبل بداية الامتحانات النهائية. ومن ينسحب بعد هذه الفترة المحددة يعتبر راسباً.

### مادة (7):

#### (أ) المواظبة

على الطالب أن يواظب على حضور المحاضرات النظرية وحلقات النقاش والدروس العملية والتدريبات الميدانية و التكاليفات، 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 راسباً في المقررات التي تغيب عن أداء الامتحان فيها. لا يعتبر الطالب راسباً في حالة التغيب بعذر قهري يقبله مجلس الكلية. وفي حال رسوب الطالب في أي مقرر يحصل على تقدير مقبول كحد أقصى عند اجتياز المقرر للمرة التالية.



## مادة (8):

### لغة الدراسة

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):

### التدريب الميداني الاولي و التدريب الميدانى المتقدم ( سنة الامتياز )

#### أ-التدريب الميدانى الاولى:

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 الأكاديمي (التدريس والبحث) قضاء فترة تدريبية فى كليات الصيدلة او مراكز البحوث . ويجب أن يشمل برنامج التدريب دورة تدريبية واحدة من دورات التدريب الإكلينيكي.

## مادة (10):

### شروط القبول

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

يجوز قبول تحويل الطلاب المقيدون 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):

### نظام التقييم

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 والتقييمات كما هو مبين بالجدول التالي.

### نظام التقييم

التقدير	الرمز	عدد النقاط	النسبة المئوية
ممتاز	A <sup>+</sup>	4	95 فأكثر
	A	3,85	90 لأقل من 95
	A <sup>-</sup>	3,7	85 لأقل من 90
جيد جدا	B <sup>+</sup>	3,3	82,5 لأقل من 85
	B	3	77,5 لأقل من 82,5
	B <sup>-</sup>	2,7	75 لأقل من 77,5
جيد	C <sup>+</sup>	2,3	72,5 لأقل من 75
	C	2	67,5 لأقل من 72,5

	<b>C<sup>-</sup></b>	<b>1,7</b>	65 لأقل من 67,5
مقبول	<b>D<sup>+</sup></b>	<b>1,3</b>	62,5 لأقل من 65
	<b>D</b>	<b>1</b>	60 لأقل من 62,5
راسب	<b>F</b>	<b>0,00</b>	أقل من 60
منسحب	<b>W</b>	-	منسحب
غير مكتمل	<b>I*</b>	-	غير مكتمل
غائب	<b>Abs E**</b>	-	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 مع الإحتفاظ بالتقدير ، وذلك في أول موعد يتم عقد الامتحان فيه لهذا المقرر على ألا يتكرر ذلك أكثر من مرتين لنفس المقرر وفي المرة الثالثة يعتبر الطالب راسباً.

**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 في الفصل الدراسي الواحد وذلك بغرض الحصول على المعدل الفصلي كما يلي:

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

ويتم حساب المعدل التراكمي كما يلي:

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

## مادة (12):

### الرسوب في المقررات

- 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 دراسي 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 أكاديمياً 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 دراسي 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 ويطبق عليه النصوص الواردة باللائحة التنفيذية لقانون تنظيم الجامعات.

## مادة (15):

### متطلبات الحصول على درجة بكالوريوس الصيدلة فارم دي

يتطلب الحصول على درجة بكالوريوس الصيدلة فارم دي طبقاً لنظام الساعات المعتمدة او ما يعادله ما يلي:

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

ثانياً: إجتيان فترة تدريب ميداني أولى باجمالي عدد 100 ساعة تدريب فعلية في 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 أكاديمي- 9 أشهر) بعد الأنتهاء من سنوات الدراسة ، طبقاً لللائحة التفصيلية الخاصة ببرنامج تدريب سنة الامتياز والتي تشمل مشروع التخرج في إحدى التخصصات المطروحة.

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

## مادة (16):

نظام تأديب الطلاب

الطلاب المقيدون بالبرنامج خاضعون للنظام التأديبي 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 كل عام بناء على اقتراح مجلس القسم العلمى المختص وموافقة مجلس الكلية والعرض على لجنة القطاع الصيدلي 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
POC	Pharmaceutical Organic Chemistry
PAC	Pharmaceutical Analytical Chemistry
PMC	Medicinal Chemistry
PG	Pharmacognosy
PM	Pharmaceutical Microbiology and Immunology
PO	Pharmacology and Toxicology
PP	Pharmacy Practice/Clinical Pharmacy
PT	Pharmaceutics and Pharmaceutical Technology
MD	Medical Courses
NP	Non professional
EN	English/Latin

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:** See programme curriculum (Appendix 2)

### 3- متطلبات الكلية

**Faculty Requirements:** See programme curriculum (Appendix 2)

### 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
PAC E06	Advanced Pharmaceutical Analysis	1	1	2
PG E08	Production and Manufacture of Medicinal plants	1	1	2
PG E09	Chromatography and Separation Techniques	1	1	2
PG E10	Alternative Medicinal Therapies	1	1	2
PM E08	Antimicrobial stewardship	1	1	2
PM E09	Infection Control	1	1	2
PM E10	Bioinformatics	1	1	2
PM E11	Gene regulation and epigenetics	1	1	2
PM E12	Proteomics	1	1	2
PO E07	Biological Standardization	1	1	2
PO E08	Veterinary Pharmacology	1	1	2
POC E04	Advanced Drug Structural Determination	1	1	2
PP E08	Clinical nutrition	1	1	2
PT E12	Quality Assurances and GMP	1	1	2
PT E13	Applied Industrial Pharmacy	1	1	2
PT E14	Cosmetic Preparations	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 )

الخطة الدراسية

## Programme Curriculum

### Table (1)

#### Semester (1) (Fall)

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	PAC 101	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutical Organic Chemistry I	POC 101	2	1	3	Registration	20	40	75	15	150	2
Pharmacy Orientation	PT 101	1	-	1	Registration	10	--	40	--	50	1
Medicinal Plants	PG 101	2	1	3	Registration	20	40	75	15	150	2
Medical Terminology	MD 101	1	-	1	Registration	10	--	40	--	50	1
English Language	EN 101	1	-	1	Registration	10	--	40	--	50	1
Information Technology	NP 101	1	1	2	Registration	15	25	60	---	100	1
Mathematics	MS 101	1	---	1	Registration	10	--	40	--	50	1
Human Rights and Fighting Corruption	NP 102	1	---	1	Registration	10	--	40	--	50	1
<b>Total</b>		<b>12</b>	<b>4</b>	<b>16</b>						<b>800</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (2)

### Semester (2) (Spring)

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	PAC 202	2	1	3	Pharmaceutical Analytical Chemistry I	20	40	75	15	150	2
Pharmaceutical Organic Chemistry II	POC 202	2	1	3	Pharmaceutical Organic Chemistry-I	20	40	75	15	150	2
Cell Biology	PM 201	1	1	2	Registration	15	25	50	10	100	1
Anatomy & Histology	MD 202	2	1	3	Registration	20	40	90	-	150	2
Physical Pharmacy	PT 202	2	1	3	Registration	20	40	75	15	150	2
Pharmacognosy I	PG 202	2	1	3	Medicinal Plants	20	40	75	15	150	2
Psychology	MD 203	1	-	1	Registration	10	--	40	--	50	1
<b>Total</b>		<b>12</b>	<b>6</b>	<b>18</b>						<b>900</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (3)

### Semester (3) (Fall)

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	PAC 303	1	1	2	Pharmaceutical Analytical Chemistry-II	15	25	50	10	100	1
Pharmaceutical Organic Chemistry III	POC 303	2	1	3	Pharmaceutical Organic Chemistry-II	20	40	75	15	150	2
Scientific Writing	NP 303	1	1	2	Registration	15	25	60	---	100	1
Pharmacognosy II	PG 303	2	1	3	Pharmacognosy-I	20	40	75	15	150	2
Physiology and Pathophysiology	MD 304	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutics I	PT 303	2	1	3	Registration	20	40	75	15	150	2
<b>Total</b>		<b>10</b>	<b>6</b>	<b>16</b>						<b>800</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (4)

### Semester (4) (Spring)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract. /Tut	Total		Period	Pract. /Tut.	Wr.	Oral		
<b>Biochemistry I</b>	PB 401	2	1	3	Registration	20	40	75	15	150	2
<b>General Microbiology and Immunology</b>	PM 402	2	1	3	Registration	20	40	75	15	150	2
<b>Instrumental Analysis</b>	PAC 404	2	1	3	Pharmaceutical Analytical Chemistry III	20	40	75	15	150	2
<b>Pathology</b>	MD 405	1	1	2	Histology	15	25	50	10	100	1
<b>Pharmaceutics II</b>	PT 404	2	1	3	Pharmaceutic I	20	40	75	15	150	2
<b>Communication skills</b>	NP404	-	1	1	Registration	10	15	25	---	50	1
<b>Biostatistics</b>	PO 401	2	-	2	Registration	25	--	75	--	100	2
<b>Total</b>		11	6	17						850	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (5)

### Semester (5) (Fall)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract. /Tut	Total		Period	Pract. /Tut.	Wr.	Oral		
<b>Biochemistry II</b>	<b>PB 502</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Biochemistry-I</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Pharmaceutical Microbiology</b>	<b>PM 503</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>General Microbiology and Immunology</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Phytochemistry I</b>	<b>PG 504</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmacognosy II Pharmaceutical Organic Chemistry II</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Pharmaceutics III</b>	<b>PT 505</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmaceutics II</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Medicinal Chemistry I</b>	<b>PMC 501</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmaceutical organic III</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Pharmacology I</b>	<b>PO 502</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Physiology &amp; Pathophysiology</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Total</b>		<b>12</b>	<b>6</b>	<b>18</b>						<b>900</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (6)

### Semester (6) (Spring)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract. /Tut	Total		Period	Pract. /Tut.	Wr.	Oral		
<b>Parasitology and Virology</b>	<b>PM 604</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Registration</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Biopharmaceutics and Pharmacokinetics</b>	<b>PT 606</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmaceutics I</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Phytochemistry II</b>	<b>PG 605</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Phytochemistry-I</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Pharmaceutics IV</b>	<b>PT 607</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmaceutics II</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Pharmacology II</b>	<b>PO 603</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmacology-1</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Medicinal Chemistry II</b>	<b>PMC 602</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Medicinal Chemistry - I</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Total</b>		<b>12</b>	<b>6</b>	<b>18</b>						<b>900</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (7)

### Semester (7) (Fall)

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 705	2	1	3	Pharmaceutical Microbiology	20	40	75	15	150	2
Pharmacology III	PO 704	2	1	3	Pharmacology-II	20	40	75	15	150	2
Applied & Forensic Pharmacognosy	PG 706	1	1	2	Phytochemistry-2	15	25	50	10	100	1
Drug Design	PMC 703	1	1	2	Pharmaceutical Organic Chemistry III	15	25	50	10	100	1
Clinical Biochemistry	PB 703	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	--	40	--	50	1
Elective	PE---	1	1	2	Registration	15	25	60	---	100	1
<b>Total</b>		<b>12</b>	<b>7</b>	<b>19</b>						<b>950</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## Table (8)

### Semester (8) (Spring)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract. /Tut	Total		Period	Pract. /Tut.	Wr.	Oral		
<b>Clinical Pharmacokinetics</b>	<b>PP 801</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Biopharmaceutics and Pharmacokinetics</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Drug Information</b>	<b>PP 802</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>Registration</b>	<b>15</b>	<b>25</b>	<b>50</b>	<b>10</b>	<b>100</b>	<b>1</b>
<b>Basic &amp; Clinical Toxicology</b>	<b>PO 805</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmacology-III</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Hospital Pharmacy</b>	<b>PP 803</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>Pharmacology II Pharmaceutics IV</b>	<b>15</b>	<b>25</b>	<b>50</b>	<b>10</b>	<b>100</b>	<b>1</b>
<b>Pharmaceutical Technology II</b>	<b>PT 809</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmaceutical Technology I</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Community Pharmacy Practice</b>	<b>PP 804</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmacology II</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Elective</b>	<b>PE ---</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>Registration</b>	<b>15</b>	<b>25</b>	<b>60</b>	<b>---</b>	<b>100</b>	<b>1</b>
<b>Total</b>		<b>11</b>	<b>7</b>	<b>18</b>						<b>900</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written



## Table (9)

### Semester (9) (Fall)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total Marks	Final Exam. Hours
		Lect.	Pract. /Tut	Total		Period	Pract. /Tut.	Wr.	Oral		
<b>Biotechnology</b>	<b>PM 906</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmaceutical Microbiology</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Clinical pharmacy I</b>	<b>PP 905</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Pharmacology 2</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Public Health</b>	<b>PM 907</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>Medical Microbiology</b>	<b>25</b>	<b>---</b>	<b>75</b>	<b>---</b>	<b>100</b>	<b>2</b>
<b>Phytotherapy and Aromatherapy</b>	<b>PG 907</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>Phytochemistry- II</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>15</b>	<b>150</b>	<b>2</b>
<b>Good Manufacturing Practice</b>	<b>PT 910</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>Registration</b>	<b>15</b>	<b>25</b>	<b>50</b>	<b>10</b>	<b>100</b>	<b>1</b>
<b>Marketing &amp; Pharmacoeconomics</b>	<b>NP 906</b>	<b>2</b>	<b>--</b>	<b>2</b>	<b>Registration</b>	<b>25</b>	<b>---</b>	<b>75</b>	<b>---</b>	<b>100</b>	<b>2</b>
<b>Elective</b>	<b>PE ---</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>Registration</b>	<b>15</b>	<b>25</b>	<b>60</b>	<b>---</b>	<b>100</b>	<b>1</b>
<b>Total</b>		<b>12</b>	<b>5</b>	<b>17</b>						<b>850</b>	

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*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

**Table (10)**  
**Semester (10) (Spring)**

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	PAC 005	2	1	3	-Pharmaceutical Analytical Chemistry-II - Pharmaceutical Microbiology	20	40	75	15	150	2
First Aid	MD 006	1	1	2	Registration	15	25	60	--	100	1
Drug interaction	PO 006	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	Registration	15	25	50	10	100	1
Professional Ethics	NP 008	1	--	1	Registration	10	--	40	--	50	1
Elective	PE ---	1	1	2	Registration	15	25	60	---	100	1
<b>Total</b>		<b>10</b>	<b>8</b>	<b>18</b>						<b>900</b>	

*Lect.* = Lecture

*Period.* = Periodical

*Pract./ Tut.* = Practical / Tutorial

*Wr.* = Written

## مرفق 3

### خاص بالمادة (19)

#### محتوى المقررات الدراسية

### Course Content

#### **POC 101 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 cycloalkanes. Stereochemistry (Optical isomers, racemic modification, nomenclature of configurations). Alkenes, alkadienes and alkynes. Alkyl halides (nomenclature, preparation and chemical reactions ( $S_N1$ ,  $S_N2$ ,  $E_1$ ,  $E_2$ )). Arenes and aromatic compounds (Kekule structure, Huckel rule, Electrophilic aromatic substitution and orientation).

#### **POC 202 Pharmaceutical Organic Chemistry II (2+1)**

This course involves different classes of organic compounds: aryl halides, Alcohols, Phenols, ethers & epoxides, aldehydes, ketones, carboxylic acid & acid derivatives, sulphonic acids, and nitrogenous compounds.

#### **POC 303 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.

#### **PAC 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.

#### **PAC 202 Pharmaceutical Analytical Chemistry II (2+1)**

Acid-Base theory, titration curves, indicators, applications. Titrations in non aqueous media, classification of solvents, theory, applications. Precipitometric

titrations: solubility product principle, titration curves, Mohr's method, volhard's method, Fajans' method, pharmaceutical application. Complexometric reactions, theory, reaction with EDTA, indicators, applications.

### **PAC 303 Pharmaceutical Analytical Chemistry III (1+1)**

Redox titrations, theory, oxidation potentials, Nernst 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. Conductometric titration : ionic conductance, definition of cell constant, conductance, applications. polarography: Ilkovic equation, dropping mercury electrodes, diffusion current, applications, derivatization polarography.

### **PAC 404 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.

### **PAC 005 Quality Control of Pharmaceuticals (2+1)**

The course is shared with departments: Microbiology & Chemistry :

I-Quality control & quality assurance of pharmaceuticals .

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.

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

III- Documentation

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

V- 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.

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

### **PMC 501 Medicinal Chemistry I (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. The course handles different classes of antibiotics and antimicrobials (natural and synthetic), beside other synthetic chemotherapeutic agents (including antivirals, antifungals and antiparasitics). Additionally, various anticancer therapies, steroidal hormones and related drugs are also covered.

### **PMC 602 Medicinal Chemistry II (2+1)**

The course is tailored to assist the students to gain the drugs affecting neurodegenerative disorders. Moreover, 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) are also handled.

### **PMC 703 Drug Design (1+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).

### **PB 401 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 502 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 703 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.

### **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 floras 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 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 chromatographic methods 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 physicochemical 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 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.

### **PM 402 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 on Host 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 503 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.

### **PM 604 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 705 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 microorganisms caused by Gram positive cocci & bacilli, Gram negative cocci & bacilli and mycobacteria of major significance to public health will be studied.

### **PM 906 Biotechnology (2+1)**

The course aims to provide students with fundamentals, scope and applications in biotechnology through studying fermentation 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 907 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 (2+0)**

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

### **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 physiology and pathophysiology disease processes regarding drugs acting endocrine system. Chemotherapeutic drugs including antimicrobials, anticancer a immunosuppressant are within the scope of the course. Stem cell therapy is al included. The anti-inflammatory, analgesics as well as gout treatments are al included.

### **PO 805 Basic & Clinical Toxicology (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.

### **PO 006 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 pharmacogenic 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.

### **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 & Histology (2+1)**

Histology:

Cytology, various tissues (epithelial, connective, muscular, and nervous), heart, blood vessels, lymphatic organs, skin and its appendages, systems (digestive and associated glands, respiratory, urinary, reproductive, and central nervous system), endocrine glands, and eye.

Anatomy :

Introduction to skeletal, muscular, and articular systems, fascia, nervous, cardiovascular, and lymphatic systems, digestive, respiratory, and urogenital systems, endocrine glands. Cytology: blood, liver, spleen, lung, kidney, lymph node, cardiac muscle, aorta, stomach, and intestine.

### **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 304 Physiology and Pathophysiology (2+1)**

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 haematological disorders, disease of urinary, pulmonary and digestive 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+1)**

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 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.

### **PP 803 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 804 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 905 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 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 101 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, hypothesis testing and chemical calculations.

### **NP 101 Information Technology ( 1+1)**

This course tends to provide students of all university's faculties with a brief introduction to the world of computers and the concept of information technology including: number systems and data representation, computer system components: hardware & software, storage and input/output systems, Operating systems and Utility Systems, software applications. Also it gives an overview about computer networks and internet: data communication, transmission modes, transmission media, computer networks, internet protocol, and internet services. It practices some computer applications in the laboratory such as Internet Access, word processing and power point. It gives students a practical experience on developing projects related to the specialty of each faculty.

### **NP 102 Human Rights and Fighting Corruption ( 1 + 0 )**

يغطي هذا المقرر الموضوعات التالية: حقوق الإنسان في القانون الجنائي، حق الإنسان في تغيير جنسيته أو التخلي عن إحدى جنسياته، المواثيق الدولية المتعلقة بحماية حقوق الإنسان، علاقة العولمة والتنمية بالحقوق الاقتصادية والاجتماعية والثقافية، الحقوق الاقتصادية والاجتماعية والثقافية للإنسان، حقوق الإنسان في الشريعة الإسلامية، حقوق المرأة في قانوني العمل والتأمين الاجتماعي، حقوق الإنسان في التقاضي، الحقوق المدنية والسياسية للإنسان



### **NP 303 Scientific Writing ( 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.

### **NP 404 Communication skills ( 0+1 )**

The course 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

### **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 007 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 008 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.

## محتوى المقررات الدراسية الاختيارية

### Elective Courses Descriptions

#### **PAC E06 Advanced Pharmaceutical Analysis (1+1)**

Electromagnetic radiation- UV and visible light- molecular absorption- Beer's Lambert Law- Monochromatic light and monochromators- Spectrophotometer- deviation from Beer's Lambert Law- Job's method- serial dilution- Calibration curve and determination of unknown- Fluorimetry- difference between fluorimetry and phosphorescence- Stoke's shift- factors affecting Fluorescence - Spectrofluorimeter- atomic spectroscopy- atomic absorption- atomic emission.

#### **PG E08 Production and Manufacture of Medicinal Plants (1+1)**

The study of commercial production of medicinal plants, cultivation, collection, drying, preservation, extraction, standardization, quality control, and final packaging of entire or powdered forms or extracts with the mphasis on the production of standardized herbals and phytopharmaceuticals.

#### **PG E09 Chromatography and Separation Techniques (1+1)**

Introduction and modes of separation for adsorption, partition, gel filtration and permeation, ion exchange and non-ion exchange, affinity chromatography and their applications. High-pressure liquid chromatography, gas liquid chromatography and their applications.

#### **PG E10 Alternative Medicinal Therapies (1+1)**

This course offers an overview of alternative medicine. Students will typically learn the many disciplines of complementary and alternative medicine available. Students might learn the concepts behind alternative treatments of diseases and how they may complement traditional medicine. Students will learn the therapeutic herbal groups and dosages. This will discuss how herbal medicines can complement or be contraindicated when used with pharmaceutical medications, as well as modern scientific research into herbal medicine.

#### **PM E08 Antimicrobial stewardship (1+1)**

It is designed to introduce students to the principles of Antimicrobial Stewardship to facilitate rational antimicrobial selection; stewardship interventions that have been reported in the literature; quality improvement methods; as well as program development, implementation and evaluation. The basic clinical science of antimicrobial use. Practical Aspects of Antimicrobial Stewardship and Application to Special Circumstances and Populations. Infection prevention and antimicrobial stewardship. Surgical site prophylaxis. Out-patient parenteral therapy.

Antimicrobial stewardship in pediatrics. Antimicrobial stewardship and transplant infectious diseases. Antimicrobial stewardship and long-term care.

### **PM E09 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. Students will be encouraged to explore aspects of clinical governance, prevention of infection and outbreak/exposure management.

### **PM E10 Bioinformatics (1+1)**

Introduces bioinformatics concepts and practice of biological databases, sequence alignment (DNA, RNA and protein analysis), gene and protein structure prediction, molecular phylogenetics, genomics and proteomics. Students will gain practical experience with bioinformatics tools and develop basic skills in the collection and presentation of bioinformatics data.

### **PM E11 Gene regulation and epigenetics (1+1)**

This course will give an introduction to the fundamentals of epigenetic control. This will examine the interplay between epigenetic control and the environment and finally the role of aberrant epigenetic control in disease. An introduction to and definition of epigenetic control of gene expression, and its importance in normal development. Cancer epigenetics and understanding how the epigenome is affected, and can also affect, cancer development and progression.

### **PM E12 Proteomics (1+1)**

The course focuses on current methodology used to analyze and identify proteins. This includes protein electrophoresis, chromatography, mass spectrometry, and protein database analysis. This course will handle new approaches to analyze metabolic pathways, and the comprehensive analysis of protein-protein interactions in different cell types.

### **PO E07 Biological Standardization (1+1)**

This course will enable the students to understand necessary knowledge and skills enabling them and to develop professional competence in recognition, analysis and discussion of general screening and bioassay of various drug classes. It will include brief accounts on basic principles of biostatistics and basics of statistical principles and procedures used in the description, measurement, analysis and interpretation of results of clinical trials. After completing the course, the students will be able to choose the appropriate biological method for the assay of different drug classes and instruct appropriate laboratory skills, including safe working practices where relevant.

### **PO E08 Veterinary Pharmacology (1+1)**

This course aims to ensure that the students understand and list the basic principles of veterinary pharmacology. Students will be also able to define pathophysiology, risk factors, symptoms, diagnosis and management of different diseases of animals such as cows, goats, dogs and other animals. This course will emphasize pathophysiology of different animal diseases and their laboratory diagnosis as well as principles of etiology and epidemiology of different animal disease. by the end of the course the students will be able to determine appropriate methods of infection control to prevent infection, construct public health by controlling infection and detecting infection methods and choose the best drugs for treatment of different animal diseases. select the appropriate medication for certain animal diseases depending on their etiology, pathophysiology and laboratory data.

### **POC E04 Advanced Drug Structural Determination (1+1)**

Spectral technique, using of spectroscopic methods in drug determination, UV (Electronic Transitions, Beer-Lambert Law, Sample Preparation, Common Transitions and Functional Groups, Conjugation, Woodward-Fieser Rules), IR (Stretching and Bending; Hooke's Law, Sample Preparation, Spectral Range; Hydrocarbons, Alcohols, Carbonyls; Structural Insight Through Changes Playing with  $k$  / bond order), NMR ( $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR) and Mass spectroscopy (Electron Impact MS, Fragmentation, High Resolution MS, Soft-ionization techniques (ESI, CI, MALDI, etc.).

### **PP E08 Clinical nutrition (1+1)**

On successful completion of the course students will be able to demonstrate knowledge of nutrition principles and their application to disease prevention and treatment. Interpret and translate scientific knowledge and principles related to nutrition into practical information. Demonstrate a knowledge of medical terminology and medical abbreviations associated with nutrition related diseases and conditions. Collect, organize and assess data relating to the health and nutritional status of individuals Topic of clinical nutrition (Nutritional Assessment, Nutrition in Obesity, Nutrition in Malnutrition, Cardiovascular disease, Diabetes, Oncology, Nutrition support methods, Aids/HIV, renal disorders, pediatric disorders and chronic diseases).

### **PT E12 Quality Assurances and GMP (1+1)**

Introduction to Quality Control and Quality Assurance, Functions of Quality Control Department, Regulatory Compliance, Good Manufacturing Practices (GMP) and Good Laboratory Practices (GLP), The FDA's Approach to GMP Inspections of Pharmaceutical Companies, Quality and compliance auditing, Documentation systems, Standard Operating Procedures (SOPs), Food, Drug and Cosmetic Acts Regulations, International Conference on Harmonization (ICH) Guideline for QA and Drug stability studies according to USP / ICH.

**PT E13 Applied Industrial Pharmacy (1+1)**

Good manufacturing practice regulations and quality assurance with emphasis on process validation and sampling techniques.

**PT E14 Cosmetic Preparations (1+1)**

Definition and concepts, classification, hair preparation, Idea generation, formulation development, manufacturing considerations of bath preparation, fragrance preparation, make-up preparation, nail lacquers, shaving preparations, after-shave preparations, skin care, anal hygiene products, antiperspirants and deodorants, quality control tests and evaluation of cosmetic products.