

المجلس الأعلى للجامعات  
لجنة قطاع الدراسات الصيدلية

## برنامج الصيدلة الإكلينيكية

درجة البكالوريوس في العلوم الصيدلانية  
(صيدلة إكلينيكية)

السنة المسجلة من قبل المجلس الأعلى للجامعات

بتوقيع أ.د. مصطفى صبح



أ.د. مصطفى صبح

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## اللائحة الداخلية لبرنامج الصيدلة الإكلينيكية

مادة (١) مقدمة:

الرسالة والأهداف

برنامج الصيدلة الإكلينيكية برنامج مرن يتلاءم مع ميول الطلاب ورغباتهم ويبرز طاقاتهم ويهدف الى تخريج صيدلى ملم بكافة متطلبات المهنة وبأحدث فروع علم الصيدلة وكل التقنيات الحديثة والتي تجعل منه صيدليا متميزا وتؤهله للعمل بالصيدليات العامة والخاصة ومصانع وشركات الأدوية ومعامل الرقابة الدوائية وتحليل الأغذية بالإضافة الى العمل فى مجال الإعلام والتسويق الدوائى ومراكز البحوث والجامعات.

والجديد الذى يضيفه هذا البرنامج هو التركيز على دور الصيدلى فى تقديم الرعاية الصحية المناسبة للمريض بداخل المستشفيات وخارجها وذلك من خلال متابعة النظام الدوائى له ودراسة مبادئ حركية الدواء الاكلينيكية وتطبيقاتها فى العلاج فى الحالات المرضية المختلفة وإيجاد الأنظمة العلاجية المناسبة وذلك بالتعاون مع الطبيب المعالج

مادة (٢) الدرجة العلمية التى تمنح للخريجين:

يمنح مجلس الجامعة، بناء على طلب مجلس كلية الصيدلة، درجة البكالوريوس فى العلوم الصيدلانية (صيدلة إكلينيكية).

مادة (٣) نظام الدراسة :

مدة الدراسة بالبرنامج خمس سنوات وفق نظام الساعات المعتمدة.  
ينقسم كل عام دراسى الى فصلين دراسيين ومدة كل فصل خمسة عشر أسبوعا. كما يجوز طرح بعض المقررات فى فصل دراسى صيفى مدته من ستة الى ثمانية أسابيع من الدراسة المكثفة.  
والساعة المعتمدة هى وحدة قياس دراسية وتعادل ساعة دراسية أسبوعية نظرية أو درسا عمليا لا يقل عن ساعتين أسبوعياً لمدة خمسة عشر أسبوعاً وتدرس على مدى فصل دراسى واحد.



مادة (٤) تصميم البرنامج الدراسي:

صمم البرنامج الدراسي بحيث يتم التعلم عن طريق المحاضرات والدروس العملية وحلقات النقاش وأيضاً إجراء بحوث بالإضافة الى التعاون مع المجتمع المحيط بالجامعة..

مادة (٥) التسجيل:

تحدد الكلية لكل مجموعة من الطلاب مرشداً أكاديمياً من أعضاء هيئة التدريس يقوم بمهام الرعاية والإرشاد العلمى ويكون مسؤولاً عن الطالب فى الشؤون العلمية والاجتماعية والنفسية وتوجيهه فى كل ما يتعلق بحياته الجامعية ويقوم بمساعدة الطلاب فى اختيار المقررات من قائمة المقررات التى تطرحها الكلية فى كل فصل دراسى.

وعلى كل طالب أن يقوم شخصياً بتسجيل المقررات التى يرغب فى دراستها فى كل فصل دراسى مع ضرورة أن يتم اختيار المقررات وعدد الساعات بالتشاور والاتفاق مع المرشد الأكاديمى.

ويشترط لتسجيل المقرر أن يكون الطالب قد اجتاز بنجاح متطلب هذا المقرر.

وينبغي أن يملأ الطالب نموذج تسجيل المقررات فى الأوقات المحددة حسب التقويم الجامعى ولا يجوز الانتظام فى الدراسة إلا بعد انتهاء عملية التسجيل.

لا يسمح للطالب بالتسجيل المتأخر إلا بموافقة عميد الكلية على ألا يزيد مدة التأخير عن أسبوع من نهاية فترة التسجيل..

(أ) العبء الدراسى:

العبء الدراسى هو عدد الساعات المعتمدة التى يقوم الطالب بتسجيلها فى الفصل الدراسى. ويجب مراعاة ألا يقل العبء الدراسى المسجل للطالب فى أى فصل دراسى عن ١٢ ساعة (اثنى عشرة ساعة معتمدة) وألا يزيد عن ٢٢ ساعة (اثنان وعشرون ساعة معتمدة).

العبء الدراسى خلال الفصل الصيفى يتراوح بين ٤ - ١٠ ساعات معتمدة.

(ب) الإضافة والحذف والانسحاب:

يجوز للطالب بعد إكمال إجراءات التسجيل أن يحذف أو يضيف إلى ساعاته المعتمدة مقررأ أو أكثر على أن يكون ذلك فى خلال الفترات المحددة للحذف والإضافة فى كل فصل مع مراعاة الحد الأدنى والحد الأقصى للعبء الدراسى.



يجوز للطالب بعد تسجيله الانسحاب من مقرر أو أكثر في أى فصل دراسى دون أن يعتبر راسباً فى هذا المقرر وذلك إذا تقدم بطلب الانسحاب خلال الفترة المسموح بها والتي يعلن عنها فى الجدول الدراسى لكل فصل.

ومن ينسحب بعد المدة المقررة يعتبر راسباً.

#### مادة (٦) المواظبة:

على الطالب أن يواظب على حضور المحاضرات النظرية والدراسات العملية ولمجلس الكلية بناء على طلب مجالس الأقسام المختصة أن يحرم الطالب من التقدم للامتحان التحريرى إذا تجاوزت نسبة غيابه ٢٥% من اجمالى الساعات المقررة للدروس العملية. حضور الامتحانات والتغيب عنها والإخلال بنظامها: يجب على الطالب أداء الامتحانات النهائية فى المواعيد المقررة لها، ويعتبر المتغيب عن الامتحان النهائى راسباً فى المقررات التى تغيب عن أداء الامتحان فيها.

#### مادة (٧) لغة الدراسة:

الدراسة فى الكلية باللغة الانجليزية. ويجوز مع ذلك تدريس بعض المقررات باللغة العربية بناء على توصية القسم المختص وموافقة مجلس الكلية ومجلس الجامعة.

#### مادة (٨) التدريب الصيفى:

على الطالب أن يكمل فترة تدريب عملى لا يقل عن ٢٠٠ ساعة تدريب (١٠٠ ساعة معتمدة) تحت إشراف عضو هيئة تدريس متخصص وذلك فى إحدى المؤسسات الصيدلية التى يقرها مجلس الكلية. بالإضافة إلى عدد ١٠٠ ساعة معتمدة تدريب إكلينيكي فى إحدى المستشفيات التعليمية. وتبدأ فترة التدريب بعد العام الثانى من الدراسة.

#### مادة (٩) شروط القبول:

يشترط فى من يتقدم للالتحاق بالبرنامج أن يستوفى الشروط التى يحددها المجلس الأعلى للجامعات. يجوز لمجلس الكلية بعد موافقة الجامعة قبول طلاب حاصلين على درجة البكالوريوس من كليات العلوم (تخصص كيمياء أو بيولوجي) والطب البشرى والطب البيطرى والتمريض والزراعة وفنون الضوابط التى



يحددها مجلس الكلية ويوافق عليها رئيس الجامعة. وتحتسب للطالب المقررات التي درسها للحصول على الدرجة الجامعية الأولى وفقاً للقواعد التي تحددها الكلية.  
يجوز قبول تحويل الطلاب المقيدون في إحدى كليات الجامعات المصرية أو الأجنبية بشرط استيفاء الطالب لمتطلبات القبول بالكلية وتحتسب للطالب المقررات التي درسها في الكلية المحول منها وفقاً للقواعد التي تحددها الكلية

#### مادة (١٠) نظام التقييم :

تتكون الدرجة النهائية في المادة من مجموع درجات الأعمال الفصلية والعملية والتحريرية والشفهية كما هو موضح بجداول البرنامج الدراسي.  
الحد الأدنى للنجاح في أي مقرر هو ٦٠٪ ولا يكون الطالب ناجحاً في أي مقرر إلا إذا حصل على ٣٠٪ من درجة الامتحان التحريري النهائي ، وتكون النسبة المئوية للمدرجات النهائية والتقدير كما مبين بالجدول المرفق.

#### نظام التقييم

| التقدير  | الرمز | عدد النقاط | النسبة المئوية    |
|----------|-------|------------|-------------------|
| ممتاز    | A     | ٤          | ٩٠ فأكثر          |
|          | A-    | ٣,٧        | ٨٥ لأقل من ٩٠     |
| جيد جداً | B+    | ٣,٢        | ٨٢,٥ لأقل من ٨٥   |
|          | B     | ٣          | ٧٧,٥ لأقل من ٨٢,٥ |
|          | B-    | ٢,٧        | ٧٥ لأقل من ٧٧,٥   |
| جيد      | C+    | ٢,٣        | ٧٥ لأقل من ٧٥     |
|          | C     | ٢          | ٧٢,٥ لأقل من ٧٢,٥ |
|          | C-    | ١,٧        | ٦٥ لأقل من ٧٢,٥   |
| مقبول    | D+    | ١,٣        | ٦٥ لأقل من ٦٥     |
|          | D     | ١,٠٠       | ٦٠ لأقل من ٦٢,٥   |
| ضعيف     | F     | ٠,٠٠       | أقل من ٦٠         |
|          | W     | -          | منسحب             |



توجد رموز أخرى للتقييم لا تقابلها نقاط وهي:

S : مستوى مرضى

U : مستوى غير مرضى

T : درجات حصل عليها طالب محول من كلية أخرى

يتم حساب المعدل التراكمى للطالب (GPA) على النحو التالي:

- أ- يتم ضرب قيمة تقدير كل مقرر دراسى (النقاط الموضحة فى الجدول) فى عدد الساعات المعتمدة لهذا المقرر لنحصل على عدد النقاط الخاصة بكل مقرر دراسى.
- ب- يتم جمع نقاط كل المقررات الدراسية التى سجل فيها الطالب.
- ج- يتم قسمة مجموع النقاط على إجمالى الساعات المسجلة للطالب لنحصل على المعدل التراكمى كما يلى:

مجموع النقاط

$$\text{المعدل التراكمى } GPA = \frac{\text{مجموع النقاط}}{\text{إجمالى الساعات المسجلة}}$$

إجمالى الساعات المسجلة

مادة (١١) الرسوب فى المقررات:

- فى حالة تغيب الطالب عن الامتحان النهائى
  - إذا حصل على أقل من ٣٠٪ من درجة الامتحان التحريرى النهائى
  - عدم تحقيق ٦٠٪ على الاقل من مجموع درجات المقرر
- إذا رسب الطالب فى أى مقرر إجبارى فى أى فصل دراسى فعليه دراسة ذات المقرر والامتحان فيه. أما إذا رسب فى مقرر إختيارى فيمكنه إعادة دراسته أو دراسة مقرر إختيارى آخر بديل لإكمال متطلبات التخرج ، وذلك بند موافقة المرشد الأكاديمى وعميد الكلية.

مادة (١٢) التثوى الاكاديمى:

- الطالب الذى يحصل على معدل تراكمى (CGPA) أقل من "١" لمدة ستة فصول دراسية متصلة او فى عشرة فصول دراسية غير متصلة يفصل من الكلية.
- يسمح للطالب ان يعيد دراسة المقررات التى اجتازها بتقدير D وذلك لتحسين المعدل التراكمى.
- وتحتسب الدرجة الأعلى التى يحصل عليها الطالب.



### مادة (١٣) الانقطاع عن الدراسة:

- يعتبر الطالب منقطعاً عن الدراسة إذا لم يسجل في فصل دراسي أو انسحب من الفصل سواء ذلك بعذر أو بدون عذر
- يجوز أن ينقطع الطالب فصلين متتاليين أو ما مجموعة ثلاثة فصول دراسية غير متتالية كحد أقصى بشرط الحصول على موافقة مجلس الكلية ، ويفصل من الجامعة في حالة انقطاعه مدة أطول من ذلك بدون عذر يقبله مجلس الكلية ويوافق عليه رئيس الجامعة.

### مادة (١٤) متطلبات الحصول على درجة البكالوريوس:

- يتطلب الحصول على درجة البكالوريوس في العلوم الصيدلانية (صيدلة إكلينيكية) ما يلي:
- ١- دراسة ١٩٧ ساعة معتمدة تشمل على مقررات تخصصية ومقررات في العلوم الأساسية والعلوم الإنسانية والاجتماعية.
  - ٢- تدريب عملي لا يقل عن ٢٠٠ ساعة تدريب (١٠٠ ساعة معتمدة) تحت إشراف عضو هيئة تدريس متخصص وذلك في إحدى المؤسسات الصيدلانية التي يقرها مجلس الكلية. بالإضافة إلى عدد ١٠٠ ساعة معتمدة تدريب إكلينيكي في إحدى المستشفيات التعليمية.

### مادة (١٥) نظام تأديب الطلاب:

الطلاب المقيدون بالبرنامج خاضعون للنظام التأديبي المبين في قانون تنظيم الجامعات المصرية قانون ٤٩ لعام ١٩٧٢ والقوانين المكملة له.

### مادة (١٦) البرنامج الدراسي

يتطلب الحصول على درجة البكالوريوس في العلوم الصيدلانية (صيدلة إكلينيكية) ما يلي:  
أولاً: دراسة ١٩٧ ساعة معتمدة موزعة على عشرة فصول دراسية وتنقسم إلى:

- ١- متطلبات الجامعة وتمثل ٩ ساعات معتمدة
- ٢- متطلبات الكلية الإلزامية وتمثل ١٨٢ ساعة معتمدة (جدول توزيع المقررات)
- ٣- متطلبات الكلية الاختيارية وتمثل ٦ ساعات معتمدة





ثانيا: تدريب عملي لا يقل عن ٢٠٠ ساعة تدريب (١٠٠ ساعة معتمدة) تحت إشراف عضو هيئة تدريس متخصص وذلك في إحدى المؤسسات الصيدلية التي يقرها مجلس الكلية. بالإضافة إلى عدد ١٠٠ ساعة معتمدة تدريب إكلينيكي في إحدى المستشفيات التعليمية. يبلغ إجمالي عدد الساعات المعتمدة



**Key for Course Abbreviations**

|        |   |
|--------|---|
| CS 000 | Computer Science                            |
| EN     | English language                            |
| HU     | Humanities                                  |
| MS     | Mathematics                                 |
| PB     | Biochemistry                                |
| PC     | Chemistry                                   |
| PG     | Pharmacognosy                               |
| PM     | Microbiology and Immunology                 |
| PO     | Pharmacology and Toxicology                 |
| PP     | Pharmacy Practice                           |
| PT     | Pharmaceutics and Pharmaceutical Technology |
| MD     | Medical Courses                             |

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.

**1. University Requirements**

| Course Code | Course Title     | Credit Hours* |     |       |
|-------------|------------------|---------------|-----|-------|
|             |                  | L             | P/T | Total |
| CS 101      | Computer Science | 1             | 1   | 2     |
| EN 101      | English Language | 2             | -   | 2     |
| HU 201      | Human Right      | 2             | -   | 2     |
| HU 302      | Psychology       | 2             | -   | 2     |
| HU 903      | Sociology        | 1             |     | 1     |
| Total       |                  | 8             | 1   | 9     |

L: Lecture, P/T: Practical or tutorial.



## 17. PROGRAMME CURRICULUM

Table (1)

| -Course Title                       | Course code | Credit hours |          |           | Prerequisite | Examination Marks* |        |     |      | Total marks | Final Exam. (hrs) |
|-------------------------------------|-------------|--------------|----------|-----------|--------------|--------------------|--------|-----|------|-------------|-------------------|
|                                     |             | Lect.        | Pract.   | Total     |              | Period.            | Pract. | Wr. | Oral |             |                   |
|                                     |             |              |          |           |              |                    |        |     |      |             |                   |
| Physical & Inorganic Chemistry      | PC 101      | 2            | 1        | 3         | Registration | 10                 | 25     | 65  | -    | 100         | 2                 |
| Pharmaceutical Organic chemistry -1 | PC102       | 2            | 1        | 3         | Registration | 10                 | 25     | 50  | 15   | 100         | 2                 |
| Biophysics                          | MD101       | 1            | 1        | 2         | Registration | 10                 | 25     | 65  | -    | 100         | 1                 |
| Botany and medicinal plants         | PG 101      | 2            | 1        | 3         | Registration | 10                 | 25     | 50  | 15   | 100         | 2                 |
| Cell Biology                        | MD 102      | 1            | 1        | 2         | Registration | 10                 | 25     | 65  | -    | 100         | 1                 |
| Mathematics and statistics          | MS 101      | 2            | -        | 2         | Registration | 10                 | -      | 90  | -    | 100         | 2                 |
| Computer sciences                   | CS 101      | 1            | 1        | 2         | Registration | 10                 | 25     | 65  | -    | 100         | 1                 |
| English language                    | EN 101      | 2            | -        | 2         | Registration | 10                 | -      | 90  | -    | 100         | 2                 |
| <b>Total</b>                        |             | <b>13</b>    | <b>6</b> | <b>19</b> |              |                    |        |     |      | <b>700</b>  |                   |

Examination Marks:

Lect = Lecture

Period = Periodical Exam.

Pract = Practical Exam.

Wr. = Written Exam.



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2. Faculty Requirements: See programme curriculum (page 10)

### 3. Elective Courses

The faculty of Pharmacy offers elective courses from which the students are free to select six credits.

| Course Code | Course Title                                   | Credit Hours |   |       |
|-------------|--|--------------|---|-------|
|             |  | L            | P | Total |
| PC E11      | Drug Design                                    | 2            | - | 2     |
| PC E12      | Advanced Pharmaceutical Analysis -Spectroscopy | 2            | - | 2     |
| PG E8       | Alternative Medicinal Therapies                | 2            | - | 2     |
| PG E9       | Production & Manufacture of Medicinal plants   | 2            | - | 2     |
| PG E10      | Chromatography and Separation Techniques       | 2            | - | 2     |
| PT E10      | Quality Assurances and GMP                     | 2            | - | 2     |
| PT E11      | Applied Industrial Pharmacy                    | 2            | - | 2     |
| PT E12      | Good Manufacturing practices                   | 2            | - | 2     |
| PT E13      | Cosmetic Preparations                          | 2            | - | 2     |
| PM E5       | Biological Standardization                     | 2            | - | 2     |
| PME6        | Antimicrobial Agents                           | 2            | - | 2     |
| PO E9       | Veterinary Pharmacology                        | 2            | - | 2     |



Table (2)

## Semester (2)

| Course Title                          | Course code | Credit hours |        |       | Prerequisite                       | Examination Marks |        |     |      | Total marks | Final Exam. (hrs) |
|---------------------------------------|-------------|--------------|--------|-------|------------------------------------|-------------------|--------|-----|------|-------------|-------------------|
|                                       |             | Lect.        | Pract. | Total |                                    | Period.           | Pract. | Wr. | Oral |             |                   |
| Pharmaceutical Organic chemistry-2    | PC 203      | 2            | 1      | 3     | Pharmaceutical Organic chemistry-1 | 10                | 25     | 50  | 15   | 100         | 2                 |
| Pharmaceutical Analytical chemistry-1 | PC 205      | 2            | 1      | 3     | Physical & inorganic chemistry     | 10                | 25     | 50  | 15   | 100         | 2                 |
| Pharmacognosy -1                      | PG 202      | 2            | 1      | 3     | Botany & Medicinal plants          | 10                | 25     | 50  | 15   | 100         | 2                 |
| Histology                             | MD 203      | 2            | 1      | 3     | Cell Biology                       | 10                | 25     | 65  | -    | 100         | 2                 |
| Physical pharmacy                     | PT 201      | 2            | 1      | 3     | Physical & inorganic chemistry     | 10                | 25     | 50  | 15   | 100         | 2                 |
| Pharmacy orientation                  | PT 202      | 2            | -      | 2     | Registration                       | 10                | -      | 90  | -    | 100         | 2                 |
| Human rights*                         | HU 201      | 2            | -      | 2     | Registration                       | 10                | -      | 90  | -    | 100         | 2                 |
| Total                                 |             | 14           | 5      | 19    |                                    |                   |        |     |      | 700         |                   |

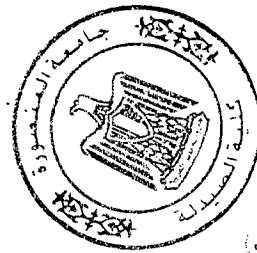


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Table (5)

Semester (5)

| Course Title                  | Course code | Credit hours |        |       | Prerequisite                       | Examination Marks |        |     |      | Max. marks | Final exam. (hrs) |
|-------------------------------|-------------|--------------|--------|-------|------------------------------------|-------------------|--------|-----|------|------------|-------------------|
|                               |             | Lect.        | Pract. | Total |                                    | Period.           | Pract. | Wr. | Oral |            |                   |
|                               |             |              |        |       |                                    |                   |        |     |      |            |                   |
| Medicinal chemistry-1         | PC 509      | 2            | 1      | 3     | Pharmaceutical Organic chemistry-3 | 10                | 25     | 50  | 15   | 100        | 2                 |
| Clinical microbiology         | PM 502      | 2            | 1      | 3     | General microbiology & immunology  | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pharmaceutical dosage forms-2 | PT 505      | 2            | 1      | 3     | Pharmaceutical dosage forms -1     | 10                | 25     | 50  | 15   | 100        | 2                 |
| Biochemistry-2                | PB 502      | 2            | 1      | 3     | Biochemistry -1                    | 10                | 25     | 50  | 15   | 100        | 2                 |
| Phytochemistry-2              | PG 505      | 2            | 1      | 3     | Phytochemistry-1                   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pathophysiology               | MD 507      | 2            | -      | 2     | Physiology                         | 10                | -      | 90  | -    | 100        | 2                 |
| Pharmacy Administration       | PT 506      | 2            | -      | 2     | Registration                       | 10                | -      | 90  | -    | 100        | 2                 |
| Total                         |             | 14           | 5      | 19    |                                    |                   |        |     |      | 700        |                   |



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Table (2)

## Semester (2)

| Course Title                          | Course code | Credit hours |        |       | Prerequisite                       | Examination Marks |        |     |      | Total marks | Final Exam. (hrs) |
|---------------------------------------|-------------|--------------|--------|-------|------------------------------------|-------------------|--------|-----|------|-------------|-------------------|
|                                       |             | Lect.        | Pract. | Total |                                    | Period.           | Pract. | Wr. | Oral |             |                   |
| Pharmaceutical Organic chemistry-2    | PC 203      | 2            | 1      | 3     | Pharmaceutical Organic chemistry-1 | 10                | 25     | 50  | 15   | 100         | 2                 |
| Pharmaceutical Analytical chemistry-1 | PC 205      | 2            | 1      | 3     | Physical & inorganic chemistry     | 10                | 25     | 50  | 15   | 100         | 2                 |
| Pharmacognosy -1                      | PG 202      | 2            | 1      | 3     | Botany & Medicinal plants          | 10                | 25     | 50  | 15   | 100         | 2                 |
| Histology                             | MD 203      | 2            | 1      | 3     | Cell Biology                       | 10                | 25     | 65  | -    | 100         | 2                 |
| Physical pharmacy                     | PT 201      | 2            | 1      | 3     | Physical & inorganic chemistry     | 10                | 25     | 50  | 15   | 100         | 2                 |
| Pharmacy orientation                  | PT 202      | 2            | -      | 2     | Registration                       | 10                | -      | 90  | -    | 100         | 2                 |
| Human rights*                         | HU 201      | 2            | -      | 2     | Registration                       | 10                | -      | 90  | -    | 100         | 2                 |
| Total                                 |             | 14           | 5      | 19    |                                    |                   |        |     |      | 700         |                   |



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Table (3)

## Semester (3)

| Course Title                          | Course code | Credit hours |        |       | Prerequisite                          | Examination Marks |        |     |      | Max. marks | Final exam. (hrs) |
|---------------------------------------|-------------|--------------|--------|-------|---------------------------------------|-------------------|--------|-----|------|------------|-------------------|
|                                       |             | Lect.        | Pract. | Total |                                       | Period.           | Pract. | Wr. | Oral |            |                   |
| Pharmaceutical Organic chemistry-3    | PC 304      | 2            | 1      | 3     | Pharmaceutical Organic chemistry-2    | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pharmaceutical Analytical chemistry-2 | PC 306      | 2            | 1      | 3     | Pharmaceutical analytical chemistry-1 | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pharmacognosy -2                      | PG 303      | 2            | 1      | 3     | Pharmacognosy -1                      | 10                | 25     | 50  | 15   | 100        | 2                 |
| Anatomy                               | MD 304      | 1            | 1      | 2     | Registration                          | 10                | 25     | 65  | -    | 100        | 1                 |
| Physiology                            | MD 305      | 3            | 1      | 4     | Cell biology                          | 10                | 25     | 65  | -    | 100        | 3                 |
| Medical Terminology                   | EN 302      | 2            | -      | 2     | English language                      | 10                | -      | 90  | -    | 100        | 2                 |
| Psychology                            | HU 302      | 2            | -      | 2     | Registration                          | 10                | -      | 90  | -    | 100        | 2                 |
| Total                                 |             | 14           | 5      | 19    |                                       |                   |        |     |      | 700        |                   |



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Table (4)

## Semester (4)

| Course Title                        | Course code | Credit hours |        |       | Prerequisite                           | Examination Marks |        |      |      | Max. marks | Final exam. (hrs) |
|-------------------------------------|-------------|--------------|--------|-------|--|-------------------|--------|------|------|------------|-------------------|
|                                     |             | Lect.        | Pract. | Total |  | Period.           | Pract. | Wr.. | Oral |            |                   |
| Biochemistry -1                     | PB 401      | 2            | 1      | 3     | Pharmaceutical organic chemistry-3     | 10                | 25     | 50   | 15   | 100        | 2                 |
| Phytochemistry -1                   | PG 404      | 2            | 1      | 3     | Pharmacology-2                         | 10                | 25     | 50   | 15   | 100        | 2                 |
| Instrumental Analysis               | PC 407      | 1            | 1      | 2     | Pharmaceutical analytical chemistry -2 | 10                | 25     | 50   | 15   | 100        | 1                 |
| General Microbiology and Immunology | PM 401      | 3            | 1      | 4     | Cell biology                           | 10                | 25     | 50   | 15   | 100        | 3                 |
| Parasitology                        | MD 406      | 1            | 1      | 2     | Cell biology                           | 10                | 25     | 50   | 15   | 100        | 1                 |
| Pharmaceutical dosage forms-1       | PT 403      | 2            | 1      | 3     | Physical pharmacy                      | 10                | 25     | 50   | 15   | 100        | 2                 |
| Pharmacy legislation                | PT 404      | 1            | -      | 1     | Registration                           | 10                | -      | 90   | -    | 100        | 1                 |
| Total                               |             | 12           | 6      | 18    |  |                   |        |      |      | 700        |                   |

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Table (5)

## Semester (5)

| Course Title                  | Course code | Credit hours |        |       | Prerequisite                       | Examination Marks |        |     |      | Max. marks | Final exam. (hrs) |
|-------------------------------|-------------|--------------|--------|-------|------------------------------------|-------------------|--------|-----|------|------------|-------------------|
|                               |             | Lect.        | Pract. | Total |                                    | Period.           | Pract. | Wt. | Oral |            |                   |
| Medicinal chemistry-1         | PC 509      | 2            | 1      | 3     | Pharmaceutical Organic chemistry-3 | 10                | 25     | 50  | 15   | 100        | 2                 |
| Clinical microbiology         | PM 502      | 2            | 1      | 3     | General microbiology & immunology  | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pharmaceutical dosage forms-2 | PT 505      | 2            | 1      | 3     | Pharmaceutical dosage forms -1     | 10                | 25     | 50  | 15   | 100        | 2                 |
| Biochemistry-2                | PB 502      | 2            | 1      | 3     | Biochemistry -1                    | 10                | 25     | 50  | 15   | 100        | 2                 |
| Phytochemistry-2              | PG 505      | 2            | 1      | 3     | Phytochemistry-1                   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pathophysiology               | MD 507      | 2            | -      | 2     | Physiology                         | 10                | -      | 90  | -    | 100        | 2                 |
| Pharmacy Administration       | PT 506      | 2            | -      | 2     | Registration                       | 10                | -      | 90  | -    | 100        | 2                 |
| Total                         |             | 14           | 5      | 19    |                                    |                   |        |     |      | 700        |                   |



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Table (6)

## Semester (6)

| Course Title                          | Course code | Credit hours |        |       | Prerequisite                      | Examination Marks |        |      |      | Max. marks | Final exam. (hrs) |
|---------------------------------------|-------------|--------------|--------|-------|-----------------------------------|-------------------|--------|------|------|------------|-------------------|
|                                       |             | Lect.        | Pract. | Total |                                   | Period.           | Pract. | Wr.. | Oral |            |                   |
| Medicinal chemistry-2                 | PC 610      | 2            | 1      | 3     | Medicinal chemistry -1            | 10                | 25     | 50   | 15   | 100        | 2                 |
| Pharmaceutical technology             | PT 607      | 2            | 1      | 3     | Registration                      | 10                | 25     | 50   | 15   | 100        | 2                 |
| Community pharmacy practice           | PT 608      | 2            | 1      | 3     | Registration                      | 10                | 25     | 50   | 15   | 100        | 2                 |
| Biopharmaceutics and pharmacokinetics | PT 609      | 2            | 1      | 3     | Pharmaceutical dosage forms-2     | 10                | 25     | 50   | 15   | 100        | 2                 |
| Quality Control of Herbal Drugs       | PG 606      | 2            | 1      | 3     | Phytochemistry-2                  | 10                | 25     | 50   | 15   | 100        | 2                 |
| Pathology                             | MD 608      | 2            | 1      | 3     | Registration                      | 10                | 25     | 50   | 15   | 100        | 2                 |
| Tromas and First Aid                  | MD 609      | 2            | -      | 2     | Histology, anatomy and physiology | 10                | -      | 75   | 15   | 100        | 2                 |
| Total                                 |             | 14           | 6      | 20    |                                   |                   |        |      |      | 700        |                   |

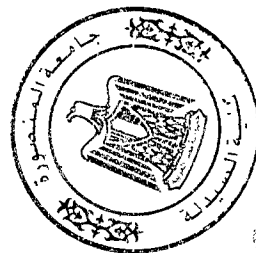


Table (7)

Semester (7)

| Course Title                          | Course code | Credit hours |        |       | Prerequisite                          | Examination Marks |        |      |      | Max. marks | Final exam. (hrs) |
|---------------------------------------|-------------|--------------|--------|-------|---------------------------------------|-------------------|--------|------|------|------------|-------------------|
|                                       |             | Lect.        | Pract. | Total |                                       | Period.           | Pract. | Wr.. | Oral |            |                   |
| Pharmacology-1                        | PO 701      | 2            | 1      | 3     | Physiology                            | 10                | 25     | 50   | 15   | 100        | 2                 |
| Radiopharmaceuticals                  | PP 701      | 1            | -      | 1     | Registration                          | 10                | -      | 90   | -    | 100        | 1                 |
| Clinical pharmacy -1                  | PP 702      | 2            | 1      | 3     | Biopharmaceutics and pharmacokinetics | 10                | 25     | 50   | 15   | 100        | 2                 |
| Hospital pharmacy                     | PP 703      | 2            | 1      | 3     | Biopharmaceutics and pharmacokinetics | 10                | 25     | 50   | 15   | 100        | 2                 |
| Controlled drug delivery system       | PT 704      | 2            | -      | 2     | Pharmaceutical dosage forms-2         | 10                | -      | 75   | 15   | 100        | 2                 |
| Public health and preventive medicine | MD 710      | 2            | -      | 2     | Clinical Microbiology                 | 10                | -      | 75   | 15   | 100        | 2                 |
| Pharmaceutical Biotechnology          | PM 703      | 2            | 1      | 3     | Biochemistry-2                        | 10                | 25     | 50   | 15   | 100        | 2                 |
| Pharmaceutical microbiology           | PM 704      | 2            | 1      | 3     | General Microbiology and Immunology   | 10                | 25     | 50   | 15   | 100        | 2                 |
| Total                                 |             | 15           | 5      | 20    |                                       |                   |        |      |      | 800        |                   |



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Table (8)

## Semester (8)

| Course Title                                 | Course code | Credit hours |        |       | Prerequisite   | Examination Marks |        |     |      | Max. marks | Final exam. (hrs) |
|--|-------------|--------------|--------|-------|--|-------------------|--------|-----|------|------------|-------------------|
|  |             | Lect.        | Pract. | Total |  | Period.           | Pract. | Wr. | Oral |            |                   |
| Pharmacology -2                              | PO 802      | 2            | 1      | 3     | Pharmacology -1  | 10                | 25     | 50  | 15   | 100        | 2                 |
| Clinical pharmacy -2                         | PP 805      | 2            | 1      | 3     | Clinical pharmacy-1  | 10                | 25     | 50  | 15   | 100        | 2                 |
| Phytotherapy                                 | PG 807      | 2            | 1      | 3     | Phytochemistry-2   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Pharmaceuticals analysis and quality control | PC 808      | 2            | 1      | 3     | Pharmaceutical analytical chemistry.-2 and Medicinal chemistry-2 | 10                | 25     | 50  | 15   | 100        | 2                 |
| Clinical biochemistry                        | PB 803      | 2            | 1      | 3     | Biochemistry-2   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Drug marketing                               | PP 806      | 1            | -      | 1     | Clinical pharmacy-1 and hospital pharmacy                        | 10                | -      | 90  | -    | 100        | 1                 |
| Drug interactions                            | PO 803      | 2            | -      | 2     | Pharmacology-1 and clinical pharmacy-1                           | 10                | -      | 75  | 15   | 100        | 2                 |
| Elective course                              | PE          | 2            | 1      | 3     | Registration   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Total  |             | 15           | 6      | 21    |  |                   |        |     |      | 800        |                   |



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Table (9)

## Semester (9)

| Course Title                      | Course code | Credit hours |          |           | Prerequisite                                      | Examination Marks |        |     |      | Max. marks | Final exam. (hrs) |
|-----------------------------------|-------------|--------------|----------|-----------|---|-------------------|--------|-----|------|------------|-------------------|
|                                   |             | Lect.        | Pract.   | Total     |   | Period.           | Pract. | Wr. | Oral |            |                   |
| Toxicology and forensic chemistry | PO 904      | 2            | 1        | 3         | Pharmacology -2                                   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Therapeutics -1                   | PO 905      | 2            | 1        | 3         | Pharmacology-2                                    | 10                | 25     | 50  | 15   | 100        | 2                 |
| Clinical pharmacokinetics         | PP 907      | 2            | 1        | 3         | Biopharmaceutics and pharmacokinetics             | 10                | 25     | 50  | 15   | 100        | 2                 |
| Oncology                          | PP 908      | 2            | 1        | 3         | Pathology and pharmacology-2                      | 10                | 25     | 50  | 15   | 100        | 2                 |
| Clinical nutrition                | PP 909      | 1            | 1        | 2         | Biochemistry-2 and pharmaceutical dosage forms -2 | 10                | 25     | 50  | 15   | 100        | 1                 |
| Clinical pharmacology             | PO 906      | 2            | 1        | 3         | Pharmacology -2                                   | 10                | 25     | 50  | 15   | 100        | 2                 |
| Sociology                         | HU 903      | 1            | -        | 1         | Registration                                      | 10                | -      | 90  | -    | 100        | 2                 |
| Elective course                   | PE          | 2            | 1        | 3         | Registration                                      | 10                | 25     | 50  | 15   | 100        | 2                 |
| <b>Total</b>                      |             | <b>14</b>    | <b>7</b> | <b>21</b> |   |                   |        |     |      | <b>800</b> |                   |



Table (10)

| Course Title  | Course code | Credit hours |        |       | Prerequisite                             | Examination Marks |        |      |      | Max. marks | Final exam. (hrs) |
|---|-------------|--------------|--------|-------|--|-------------------|--------|------|------|------------|-------------------|
|   |             | Lect.        | Pract. | Total |  | Period.           | Pract. | Wr.. | Oral |            |                   |
|   |             |              |        |       |  |                   |        |      |      |            |                   |
| Therapeutics -2                                       | PO 007      | 2            | 1      | 3     | Therapeutics -1                          | 10                | 25     | 50   | 15   | 100        | 2                 |
| Treatment of dermatological and reproductive diseases | PP 010      | 1            | 1      | 2     | Pathology and pharmacology-2             | 10                | 25     | 50   | 15   | 100        | 1                 |
| Treatment of Pediatrics diseases                      | PP 011      | 2            | 1      | 3     | Pathology and pharmacology-2             | 10                | 25     | 50   | 15   | 100        | 2                 |
| Treatment of Cardiovascular diseases                  | PP 012      | 2            | 1      | 3     | Pathology and pharmacology-2             | 10                | 25     | 50   | 15   | 100        | 2                 |
| Gastroenterology                                      | PP 013      | 2            | 1      | 3     | Pathology and pharmacology-2             | 10                | 25     | 50   | 15   | 100        | 2                 |
| Treatment of Respiratory system diseases              | PP 014      | 2            | 1      | 3     | Pathology and pharmacology-2             | 10                | 25     | 50   | 15   | 100        | 2                 |
| Drug information                                      | PP 015      | 1            | -      | 1     | Pharmacology -2 and Clinical pharmacy -2 | 10                | -      | 75   | 15   | 100        | 2                 |
| Elective course                                       | PE          | 2            | 1      | 3     | Registration                             | 10                | 25     | 50   | 15   | 100        | 2                 |
| Total   |             | 14           | 7      | 21    |  |                   |        |      |      | 800        |                   |



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## 18 COURSE DESCRIPTIONS

### **PC 101 Physical and Inorganic Chemistry**

Matter; its properties and measurement, electromagnetic spectrum, atomic structure, chemical bonding and intermolecular forces. Gases, liquids, and solids. Man and his environment and nuclear chemistry.

### **PC 102 Pharmaceutical Organic Chemistry (1)**

Nature of organic compounds and structures. Nomenclature, aliphatic (saturated and unsaturated) hydrocarbons. Organic reactions (substitutions, additions, eliminations and condensations). Chemistry of the different organic classes: halogenated hydrocarbons, alcohols, ethers, carbonyl compounds, mono- and dibasic carboxylic acids and derivatives, amino acids.

### **PC 203 Pharmaceutical Organic Chemistry (2)**

Chemistry of aromatic organic compounds including aromatic hydrocarbons, halogen and nitro derivatives, amines and diazonium salts, phenols, aromatic carboxylic acids, aromatic aldehydes, aromatic ketones, sulfonic acids and polynuclear aromatic hydrocarbons. Introduction to use of spectroscopic methods in organic chemistry (UV, IR, MS, NMR).

### **PC 304 Pharmaceutical Organic Chemistry (3)**

Stereochemistry and Stereoisomerism. Organic reaction mechanisms (substitutions, additions, eliminations and condensations). Heterocyclic compounds including monocyclic monoheteroatom and fused bicyclic compounds.

### **PC 205 Pharmaceutical Analytical Chemistry (1)**

Mixtures (suspensions, colloids and solutions), colligative properties of solutions (vapour pressure, osmotic pressure, effects on boiling and freezing points), Analytical chemistry Quantitative analytical chemistry comprises; acid base titrations and buffer solution, precipitometry and gravimetry.

### **PC 306 Pharmaceutical Analytical Chemistry (2)**

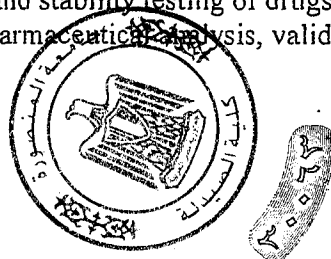
An introduction to statistical analysis, Oxidation-reduction titrations, (electrical properties of redox systems, factors affecting oxidation potential, redox titration curves). Complexometry (importance complexones stability titration curves, application, direct EDTA titrations, masking and demasking, non EDTA titrations)

### **PC 407 Instrumental Analysis**

Spectrophotometric methods of analysis including; ultra-violet, visible and flame photometry, spectrofluorometry, atomic absorption & flame, electrochemistry (potentiometry, conductimetry; polarography), chromatography.

### **PC 808 Pharmaceutical Analysis and Quality Control**

Control and quality assurance, inprocess control and validation, sampling process prior to analysis, analysis of raw materials and finished products using reference standards, pharmacopeial methods of stability and stability testing of drugs, performance and calibration of instruments used in pharmaceutical analysis, validation of analytical methods and ISO and BSI





**PC 509 Medicinal Chemistry (1)**

Introduction to pharmaceutical and medicinal chemistry, physicochemical properties of drugs in relation to biological action, chemotherapeutic agents, synthetic antimicrobial agents, malaria chemotherapy, antibacterial antibiotics and cancer chemotherapy.

**PC 610 Medicinal Chemistry (2)**

Central nervous system depressants, central nervous system stimulants, cardiovascular agents, analgesic agents, steroids and related compounds.

**PC E11 Drug Design**

Structure activity relationships, quantum mechanical approaches, molecular connectivity, pharmacophore generation, molecular modification by isosteric replacement. Natural products leading to new pharmaceuticals, mathematical treatment serving prediction, defining sites and targets, molecular modeling, prodrugs and drug latentiation.

**PC E12 Advanced Pharmaceutical Analysis -Spectroscopy**

Applications of instrumental methods of analysis (ultraviolet and infrared spectroscopy; NMR; mass spectrometry; atomic absorption spectroscopy) to pharmaceutical compounds.

**PG 101 Botany and Medicinal Plants**

Plant Kingdom; classification and systematic botany of some lower and higher plants with examples of medically active plants; Cytology, plant physiology,. A general introduction to pharmacognosy (cultivation, collection, drying, packing, storage, and adulteration of medicinal plants), and a detailed pharmacognostical study of drugs composed of leaves

**PG 202 Pharmacognosy (1)**

Detailed pharmacognostical study of drugs composed of flowers, barks, galls, woods, and herbs.

**PG 303 Pharmacognosy (2)**

Detailed pharmacognostical study of drugs composed of seeds, fruits, rhizomes and roots; animal drugs and unorganized drugs

**PG 404 Phytochemistry (1)**

Devoted to the study of plants therapeutically active principles; volatile oils, carbohydrates, resins and resin combinations, bitter principles and tannins

**PG 505 Phytochemistry (2)**

Detailed study of phytochemicals; alkaloids and glycosides, in addition to hallucinating and anticancer drugs. Introduction to chromatography and separation technique.

**PG 606 Quality Control of Herbal Drugs**

Quality control of herbal drugs including; herbal adulteration, detection of common pollutants in herbal medicine such as pesticide residues, heavy metal, radioactive contaminants, aflatoxins, bacteria and fungi.

**PG 807 Phytotherapy**

Guidelines for prescribing herbal medicines, drugs affecting digestive system, cardiovascular system, respiratory system, nonspecific enhancement of resistance, urinary





system, rheumatic conditions, nervous system, gynaecological conditions, cancer, skin diseases, eye diseases, wounds and other injuries.

**PG E8 Alternative Medicinal Therapies**  
The study of herbal preparations, nutritional supplements, and homeopathies. The study of herbal preparations that are widely used by the general public as self-selected OTC (over-the-counter) products/NPDs (nonprescription drugs). Food items for therapeutic, disease prevention, or health promotion purposes. Emphasis will be placed on the role of the pharmacist to help clients make an informed choice and counsel them on the selection of useful and safe products.

**PG E9 Productions and Manufacture of Medicinal Plants**  
Commercial production of medicinal plants, cultivation, collection, drying, preservation, extraction, quality control, and final packaging of entire or powdered forms or extracts.

**PG E10 Chromatography and Separation Techniques**  
Introduction and modes of separation, gel filtration and permeation, ion exchange chromatography, type properties, ion exchange and non-ion exchange manifestation and applications. High-pressure liquid chromatography, gas liquid chromatography and their applications.

**PT 201 Physical Pharmacy**  
Principles of physical pharmacy, rheology and the flow of fluids, surface and interfacial phenomena, solutions and their properties, solubility and dissolution rate, disperse systems

**PT 202 Pharmacy Orientation**  
Topic covered: History of pharmacy practice with particular emphasis on Arab impact, roles of the pharmacist, pharmacy organizations, systems of medicine, ethics of pharmacy, system for weights and measures, routes of drug administration, introduction to pharmaceutical dosage forms, types of prescription, and incompatibilities, pharmaceutical terminology.

**PT 403 Pharmaceutical Dosage Forms (I)**  
Includes, pharmaceutical calculation, pharmaceutical solutions, colloids and macromolecular system, coarse dispersions, suspensions and emulsions. Formulation, preparation and evaluation of solid forms, microemulsions, powders and granules, tablets, coating, hard capsules, soft capsules and microencapsulation

**PT 404 Pharmacy Legislation**  
A detailed presentation of law that governs and affects the practice of pharmacy, legal principles for non-controlled and controlled prescriptions, over-the-counter drug requirements, opening new pharmacies, opening medical stores, opening drug stores, 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.



Definition and concepts, classification, hair preparation, bath preparation, after-shave preparation, make-up preparation, nail lacquers, shaving preparations, antiperspirants and deodorants, quality preparations, skin care, anal hygiene products, antipruritics and cosmetic products.

#### PT E13 Cosmetic Preparations

Concepts, objectives and applicability, general provisions, organization and personal, Building and facilities, materials, equipment, production and process controls, packing and labeling, control, distribution, laboratory controls, records and reports, returned and salvaged drug products, repackaging, inspections and recalls

#### PT E12 Good Manufacturing Practices

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

#### PT E11 Applied Industrial Pharmacy

Quality control and assurance organization, analytical control, inspection control, documentation, environmental control, GMP regulations, statistical quality control.

#### PT E10 Quality Assurances and GMP

Factors affecting drug absorption, factors affecting drug elimination, product development, pharmacokinetics following I.V. administration, pharmacokinetics following oral dosage forms, kinetics of drug absorption, clearance, bioavailability and bioequivalence, absolute and relative bioavailability, assessment of bioavailability and correlation between in vitro dissolution and in vivo absorption.

#### PT 609 Biopharmaceutics and Pharmacokinetics

Concept and techniques of pharmaceutical care, the pharmacy profession, professional communication, patient counseling, problem solving skills, role of the pharmacist in management of symptoms of certain disease of cardiovascular system, GIT, kidney, respiratory tract, eye, skin and certain rheumatic and metabolic disease.

#### PT 608 Community Pharmacy Practice

Heat transfer, evaporation, drying, extraction, crystallization, filtration, centrifugation and distillation; Mixing, emulsification, homogenization, size reduction, size separation, size enlargements, materials for plant constructions, packaging materials, good manufacturing practice, flow of fluids, mass transfer, safety measures and validation

#### PT 607 Pharmaceutical Technology

Capital requirements, purchasing and financing a new pharmacy, location analysis, pharmacy layout design, space management for pharmacy practice, inventory purchasing and control, OTC merchandising, advertising, interpersonal communication, inter-professional relations and patient consultation

#### PT 506 Pharmacy Administration

Formulation, preparation and evaluation of semisolid and related dosage forms, transdermals, topical Drugs and Suppositories; Parental medications, ophthalmic preparations

#### PT 505 Pharmaceutical Dosage Forms (2)

**PM 401 General Microbiology and Immunology**  
Eukaryotic and prokaryotic cells, nomenclature of microorganisms, structure and form of the bacterial cells, spores, mycoplasmas or PLO, actinomycetes, Rickettsiae, viruses, eukaryotic microorganisms (fungi), bacterial genetics, molecular genetics, physiology of microorganisms, the growth curve microbial metabolism.

**PM 502 Clinical Microbiology**  
Topic covered include: Bacteriology; gram positive bacteria, the mycobacterium group, Gram negative bacteria, Chlamydia and Rickettsiae. Mycology: Ringworm, Moniliasis, Maduromycosis and Sporotrichosis. Virology: RNA viruses and DNA viruses  
Immunology: Host parasite relationship, Non-specific and specific immunity, Mechanism of protective immunity, Hypersensitivity and in vitro antigen antibody reactions, Autoimmunity and auto-immune disease, Immune deficiency disorders, Transplantation immunology, Cancer immunology, Immunological tolerance

**PB 703 Pharmaceutical Biotechnology**  
Introduction, biology of industrial micro-organisms, biophysical and biochemical processes, introduction to tissue culture and genetic engineering techniques. Techniques for the improvement of the economically important plants and animals and for the development of micro-organisms to act on the environment. Manipulation of living organisms, especially at the molecular genetic level, to produce new products, such as hormones, vaccines or monoclonal antibodies.  
production of pharmaceuticals by microorganisms. Gene therapy.

**PM 704 Pharmaceutical Microbiology**  
Sterilization, sterilization indicators, sterility testing, microbial contamination of pharmaceutical products, aseptic area, the microbiological quality of pharmaceuticals. Antimicrobial agents: classification, mechanism of action of antimicrobial drugs, drug combination, resistance of microorganisms to antimicrobial agents, assessment of a new antibiotic, microbiological assay of antibiotics, microbiological assay of vitamins, amino acids and growth factor, mode of action of nonantibiotic antimicrobial agents. Chemical disinfectants, antiseptics and preservatives.

**PM E5 Biological Standardization**  
Assays of hormones, sera, vaccines, toxins, antitoxins, antibiotics and vitamins.

**PM E6 Antimicrobial Agents**  
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 t

**PO 701 Pharmacology (1)**  
The general principles of pharmacology, pharmacokinetics, pharmacodynamics, receptor theory and drug interaction. This is followed by a comprehensive study of drugs acting on the autonomic nervous system, cardiovascular system and renal system and autacoids.

**PO 802 Pharmacology (2)**  
Drugs affecting the central nervous system, the gastrointestinal system, the blood and blood forming elements, as well as the drugs acting locally. The course deals with the chemotherapy of microbial diseases, neoplastic diseases and parasitic infestation and the study of hormones and hormone antagonists.



**PO 803 Drug Interactions**  
 Mechanism of drug interaction, significance of drug-drug interaction, management of drug-drug interaction, drug interaction of antibiotics, antiarrhythmics, anticoagulants, anticonvulsants, barbiturates, beta-agonists and antagonists, calcium channel antagonists, sulfonamides, drug-food interaction, drug-smoking interaction, drug-environment interaction.

**PO 904 Toxicology and Forensic Chemistry**  
 Introduction to toxicology, general principles of toxicology, disposition of toxicants, poisoning with common drugs, poisoning with common chemicals, chemical and biological warfare agents, radiation and radioactive material toxicity, general management of poisoning, clinical toxicology of specific drug groups, management of environmental poisoning with natural toxins, maternal, foetal and neonatal toxicity. Therapeutic regimens for important prevalent diseases, including non-pharmacological approaches, pharmacotherapeutic requirements for treatment of pediatric and geriatric patients, and for pregnant and lactating mothers, immuno-compromised patients, patients with reduced organ function, and those with multi-morbidities, importance of form and route of administration, dialysis procedures, characteristics of certain therapeutic regimens, particularly with regard to anti-infective therapy, oncological therapy, and supportive therapy, anticoagulant therapy, immuno- and gene therapy and therapy of patients in intensive care.

**PO 905 Therapeutics (1)**

**PO 906 Clinical Pharmacology**  
 General principles of pharmacotherapy, principles of pharmacotherapy in special patients, impact of drug interactions on therapeutics, pharmacotherapy for infectious diseases, cardiovascular disorders, respiratory disorders, gastrointestinal tract disorders and neurological and psychiatric disorders.

**PO 007 Therapeutics (2)**

**PO E9 Veterinary Pharmacology**  
 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.

**PB 401 Biochemistry (1)**

Subcellular organelles and membranes. Biological and biochemical properties of proteins, nucleic acids, carbohydrates, lipids, porphyrins and enzymes. Biological oxidations, and related biochemical processes.

**PB 502 Biochemistry (2)**

Metabolic map, regulation of metabolism, metabolism of carbohydrates, metabolism of lipids, nitrogen metabolism, integration of metabolism.

**PB 803 Clinical Biochemistry**

The course covers the analysis of blood and body fluid tests for the functional state of liver, kidney, heart, bone, gastrointestinal tract, endocrine glands, and interpretation of the results in relation to health and disease.





soft tissue injuries, rescue and transportation  
Basic Life Support, bleeding, shock, medical emergencies, poisoning, bones and joints,

#### MD 609 First Aid

The study of the etiology, principle diagnostic features, and main characteristics of diseases of the cardiovascular system, respiratory tract, central nervous system and other important organ systems of the body.

#### MD 608 Pathology

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 507 Pathophysiology

Introduction, protozoology; amoebae; ciliate; flagellates; blood and tissue sporozoa. Medical helminthology; nematodes; cestodes; trematodes, and arthropods.

#### MD 406 Parasitology

Introduction ( body water, homeostasis, transport of materials), nervous system (autonomic nervous system), neuron structure and function (reflex arc), cardiovascular system, blood, respiratory cycle, gastrointestinal system, reproduction system, renal system, endocrine glands and body temperature regulation

#### MD 305 Physiology

Introduction, skeletal system, muscular system, articular system, fascia, cardio-vascular system, lymphatic system, nervous system, digestive system, respiratory system, urogenital system, endocrine glands, cytology, blood, structure of liver, spleen, lungs, kidney, lymph nodes, cardiac muscle, stomach, intestine and aorta

#### MD 304 Anatomy

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, central nervous system), endocrine glands and eye.

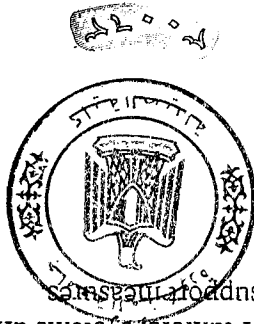
#### MD 203 Histology

The cell theory, membranous organelles, non-membranous organelles, the cell inclusions, the nucleus, cell growth and proliferation, apoptosis, apoptosis and cancer, apoptosis and AIDS, apoptosis and organ transplants, cellular aging.

#### MD 102 Cell Biology

Cell membrane structure, method of transport, channel types, receptors. Application of action potential, electrocardiogram and electroencephalogram identification and waves elucidation.

#### MD 101 Biophysics



advant therapy, patients factors and patients support measures  
Cancer etiology, risk factors, prognosis, types of tumors, systems affected, treatment,

#### PP 908 Oncology

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

#### PP 907 Clinical Pharmacokinetics

advertising distribution, marketing information system.  
Marketing analysis, orientation to decision making, management of new product venture,

#### PP 806 Drug Marketing

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

#### PP 805 Clinical Pharmacy (2)

eg. Microcapsules – Bioadhesives.  
Controlled and Modulated release drug delivery systems, theory, methods.

#### PP 704 Controlled Drug Delivery

therapeutic committee and manufacturing units in hospitals.  
manufacture of sterile and non-sterile products, I. V. admixtures, pharmacy and  
dressing and sutures, plasma substitute, central sterile supply unit and its management,  
dispensing, hospital formulary, radio-pharmaceuticals and nuclear pharmacy, surgical  
Organisation and structure of a hospital pharmacy, hospital pharmacy department and

#### PP 703 Hospital Pharmacy

adverse drug reactions, drugs interference and clinical laboratory data.  
taking, clinical problem solving. Topics of discussion include, clinical drug-interactions,  
Definition and concepts, case history, patient management approach, patient history

#### PP 702 Clinical Pharmacy (1)

control of radiopharmaceuticals. Biologic effects of various radiations  
medical diagnosis, therapy and industry. Rationale for utility, preparation and quality  
Basic principles involving the application of radiation and radioactive compounds in

#### PP 701 Radiopharmaceuticals

health, environmental pollution, waste water treatment, waste disposal  
health, water-borne and food borne diseases, milk-borne diseases, nutrition and family  
communicable diseases, immunization, infections, occupational medicine, environmental  
Introduction, epidemiology, communicable and non-communicable diseases, control of

#### MID 710 Public Health

**PP 909 Clinical 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. Fluid and electrolyte therapy and acid-base balance.

**PP 010 Treatment of Dermatological and Reproductive Disease**  
Most popular skin diseases, types, bacterial, viral and fungal diseases, differentiation.

**PP 011 Treatment of Pediatrics Disease**  
Nutritional requirements in neonates and infants, Nutritional disorders, neonatology, infectious diseases in pediatrics, congenital heart diseases, endocrine disorders, neurological disorders, pediatric emergencies.

**PP 012 Treatment of Cardiovascular Disease**  
Diseases comprising the cardiovascular system, symptoms, prognosis drugs, selection, patients advice with hospital setting practice.

**PP 013 Gastroenterology**  
GIT diseases, epidemiological aspects, symptoms, treatment, patient advice, case reports.

**PP 014 Treatment of Respiratory System Disease**  
Infections, occupational, immunological diseases. Assessment of respiratory efficiency treatment, O<sub>2</sub> supply with case study reports.

**PP 015 Drug Information**  
Drug information and poison information centres, drug-drug interactions, drug-food interactions, drug disease interactions, and intravenous incompatibilities. Use of the Internet for drug and research information.

**MS 101 Mathematics and Statistics**  
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.

**CS 101 Computer Science**  
Introduction to computer technology. Computer hardware, software and operating systems. Using various input/output devices and operating systems, data organization, database, and presentation graphics. How to use the Internet (searching and finding topics) and accessing e-mail.

**EN 101 English Language**  
Training in reading, comprehension, basic grammatical rules, writing and translation. The course adopts a systematic approach to improve writing skills, such as idea development, paragraph structure, introductions, summaries and conclusions.





**EN 302 Medical Terminology**  
Train the students to understand medical and pharmaceutical terminologies, medical abbreviations, medical idioms, suffixes and prefixes.

**HU 201 Human rights**

**HU 302 Psychology**  
The objective of this course is to help understand the behavior of the people around us. Topics include: Contemporary psychology: Psychological processes, sensation, perception, conditioned learning, motivation. Secondary psychological processes: learning, memory, language and cognition, intelligence, personality, developmental psychology, environmental and child psychology.  
Behavior dynamics: Groups, the individual, environmental, group problems, differentiation, density, handicaps, aggression, the media.  
Mental Health: signs of good mental health and disturbances (neuroses and psychoses), conflicts and frustration as precursors to the neuroses, genetic predisposition and diseases as precursors to the psychoses, some of the main therapies in psychology.

**HU 903 Sociology**

Culture ethnicity, ethnocentrism, prejudice, race and stereotype subculture, skills of communication (verbal and non verbal)



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