



## توصيف برنامج دكتوراة Clinical pharmacology ( عام 2013-2014 )

### \* معلومات أساسية : Basic information

١ - اسم البرنامج : **MD of Clinical pharmacology.**

٢ - طبيعة البرنامج : ( احادى /single )

٣- القسم/ الأقسام المسؤولة عن البرنامج: Clinical pharmacology

٤- تاريخ إقرار البرنامج فى مجلس القسم : 5 / 9 / ٢٠١٣

٥- تاريخ إقرار البرنامج فى مجلس الكلية ٣٥٦ : 15 / 9 / ٢٠١٣

٦- مسؤول البرنامج **Prof. Dr ./Mohanad Mohamed Ibrahim Shehab**

٧- المراجعة الداخلية للبرنامج: **Pro Dr/Ahmed Selim Mohamed Selim**

٨- المراجعة الخارجية للبرنامج: **Prof. Dr Prof. Dr /Hammoda Hussin Sharaf .**

### \* معلومات متخصصة : Professional information

١ - **الأهداف العامة للبرنامج** :

#### 1- Program aims:

*The overall aims of the program are:*

1.1. Understanding basic theories and mastering practical skills and methods in pharmacology and relevant sciences and its proper application in performing sound research that add to human knowledge in different aspects of pharmacology

1. 2.Applying current research issues and professional problems regarding practicing pharmacology and regarding basic sciences and try to resolve them in innovative way through analytical and criticizing methods.

1.3.Utilization of appropriate techniques and develop new one to practice pharmacology either as teacher , researcher or consultant.

1.4.Master communication and administration skills that enable him / her



to lead a team work , make decisions in different professional sessions in different aspects of practicing pharmacology .This may achieve proper employment , beneficial utilization and preservation of available resources.

1.5.understanding the role of good practice in pharmacology as regards wise prescription of drugs and awareness of side effects and environmental hazards associated with exposure to chemicals and drugs on development of community and environmental preservation.

1.6.Conducting himself / herself during his professional practices as teacher , researcher and consultant of pharmacology in a manner reflecting integrity , sincerity , respecting ethical codes ,self development and continuous learning.

## ٢ - المخرجات التعليمية المستهدفة من البرنامج :

### 2-Intended Learning Outcomes (ILOS):

#### 2.a. Knowledge and Understanding

#### ٢.أ - المعرفة والفهم :

*On successful completion of the program, the graduate will be able to:*

2.a.1.Know the essential facts about common drugs including mechanism of action, therapeutic uses , kinetics, manifestation of toxicity.

2.a.2. Utilize relevant knowledge of related basic sciences in understanding the essential facts of drug action.

2.a.3. illustrate logic scientific and ethical principles and utilize them in practicing pharmacology as teacher , researcher or consultant.

2.a.4.Know the rules that ensure the administration of drugs to humans and animals for the purpose of research.

2.a.5.Describe the principles of quality control in performing and analyzing results of drug research

2.a.6. Highlight the hazards related to handling of drugs for purpose of research or therapy and construct plans to avoid them.

#### 2.b. Intellectual Skills:

#### ٢.ب - القدرات الذهنية :-

*On successful completion of the program, the graduate will be able to:*

2.b.1.Integrate the main facts about physical and biological properties of the drugs to make logical conclusions about the use of drugs in treatment of diseases.

2.b.2.Evaluate the role of a particular drug in therapeutic plan in order to treat or prevent specific disease based on sound information about the drug and the patients .



2.b.3.Design research studies that add to the human knowledge as regards the effect of new chemical or botanical substances , their therapeutic values and interaction with other

2.b.4.Formulate research results related to drugs in clear , logic and convincing way in the form of research paper to be published in a scientific journal or conference .

2.b.5. Assess and plan to avoid hazards encountered during drug research regarding injuries and infections caused by dealing with experimental animals , undesired biological effects of experimental drugs on research team.

2.b.6. Plan to improve research tools in pharmacology and develop new ones aiming at understanding the biological effects , therapeutic value and drug interactions of drugs and chemicals

2.b.7.Construct competent plan to investigate drug related research topic.

2.b.8. Integrate his scientific background in pharmacology with that of related sciences in order to interpret the results of research topics in pharmacology

## 2.c. Practical and professional Skills:

٢.ج . مهارات مهنية وعملية

*On successful completion of the program, the graduate will be able to :*

2.c.1. Apply with precision the technical skills required for investigating research topics in pharmacology .

2.c.2. Write case report about either about the action of specific drug on experimental animals and the use of specific drugs in treatment of particular clinical case for scientific or medicolegal purposes.

2.c.3. Manage to achieve maximal efficacy and manipulate them to pharmacology for use in various situations encountered during research of available research techniques and equipments.

2.c.4. Apply technical facilities to achieve maximal precision and clear presentation of research experimental results.

2.c.5. Use his advanced knowledge in pharmacology to solve drug related health problems and train junior researchers in pharmacology about advanced research techniques and medical personells in other clinical departments about the recent advances in drug therapy.



٢. د. مهارات عامة و منتقلة:

## 2.d. General and transferable skills:-

*By the end of the program the candidate should be able to:*

- 2.d.1. Use appropriate methods of communication to be suitable for specific situations and specific target persons
- 2.d.2. Apply information technology to collect , categorize and present data either for research , teaching or providing consultations about drugs
- 2.d.3. Select the proper method to transfer knowledge and evaluate target personells (students , junior staff members , paramedical)
- 2.d.4. Utilize all sources of information to continually update his knowledge and improve his scientific and teaching performance .
- 2.d.5. Use the main sources information (textbooks , journals , conferences , web sites) in pharmacology and related sciences and use them in obtaining knowledge required for pharmacological practice..
- 2.d.6. Communicate with junior stuff members in the department and students as a leader and show respect to senior stuff .
- 2.d.7. Establish and respect time plans in performing his duties in department either as researcher , teacher or advisor.

## 3- Academic Standards

٣ - المعايير الأكاديمية للبرنامج:

- **Academic Standards of MD Program of clinical pharmacology** , approved in department council date 6 / 2013, and in faculty council 354 date 16/ 6 / 2013.  
(ملحق ١)

## 4- Reference standards (benchmarks)

٤ - العلامات المرجعية:

- a) المعايير القياسية لبرامج الدراسات العليا (درجة الدكتوراة) الصادرة عن الهيئة القومية لجودة التعليم والإعتماد (مارس ٢٠٠٩) (ملحق ٢)

### b) External references standards (Benchmarks): المعايير المرجعية الخارجية

External reference points/benchmarks are selected to confirm the appropriateness of the objectives, ILOs of the program

مقارنة ما يقدمه البرنامج من نتائج تعليمية مستهدفة مع المعايير القياسية العامة و المعايير المرجعية الخارجية

(ملحق ٤)



#### 4 - هيكل ومكونات البرنامج :

#### (4): Curriculum structure and contents:

#### أ - مدة البرنامج :

**120 weeks** Two years to pass MD. degree

**1<sup>st</sup> part:** - One Semester (6 months).

**2<sup>nd</sup> part:** - Two Semesters (1 year).

**Thesis:** - Six months

#### ب - هيكل البرنامج :

- **Total hours of program 60 credit hours**
- **Theoretical 420 hours**
- **Practical 540 hours**
- **Compulsory 960 hours**
- **Selective :none**

#### • ج: مستويات ومقررات البرنامج:

الساعات المعتمدة	الكود	المقررات	البند
		الجامعة والكلية	متطلبات
10 hours	PHAR 701	Basic pharmacology Theoretical lectures Practical Courses	الجزء الأول
10 hours		Activities	كراسة النشطة
10 hours	PHAR 702	Applied pharmacology Theoretical lectures Practical Courses	الجزء الثاني
30 hours		Thesis For MD. degree in pharmacology	
60 hours			الاجمالي



**First part (one semester /6 months):**

**Compulsory courses:**

Course Title	Course Code	NO. of hours per week			Total teaching total hours/ semester
		Theoretical	Laboratory	Total	
		Lectures	Seminars /practical		
Basic pharmacology	<b>PHAR 701</b>	7	9	16	240
<b>Total:</b>		7	9	16	240Hours

a- Elective courses: none

**Second part (3 semesters/18 months)**

**a- Compulsory courses:**

Course Title	Course Code	NO. of hours per week			Total teaching hours\ 3 semesters
		Theoretical	Laboratory /practical	Total	
Applied pharmacology	<b>PHAR 702</b>	7	9	16	720
<b>Total:</b>		7	9	16	720 hours

b- Elective courses: none

**5 - متطلبات الإلتحاق بالبرنامج :**

**(5): Program admission requirements:**

مادة ( ٢٣ ) : يشترط لقبول الطالب لدرجة الدكتوراه في الطب أو الجراحة أو العلوم الطبية الأساسية أن يكون حاصلًا على درجة الماجستير في مادة التخصص بتقدير جيد على الأقل من إحدى جامعات ج . م . ع أو على درجة معادلة لها من معهد



علمى آخر معترف به من الجامعة .

☒ مدة الدراسة لنيل الدكتوراه ثلاث سنوات ونصف موزعة كما لاتي :

• جزء أول : علوم أساسية • فصل دراسى لمدة ستة شهور ( ٦ ساعات معتمدة ) ومن يراسب يعيد مادة الرسوب فقط .

• الجزء الثانى : ثلاث فصول دراسية لمدة سنة ونصف ( ٣٩ ) ساعة معتمدة يستوفى خلالها الطالب الساعات المعتمدة ثم

يسمح له بالتقدم لامتحان التحريرى وإذا اجتاز الامتحان التحريرى بنجاح يحق له التقدم الى الامتحان

الشفهى والعملى والإكلينيكي خلال شهر من تاريخ الامتحان التحريرى .

• رسالة ( ١٥ ساعة معتمدة )

تبدأ الدراسة عند بداية التسجيل تنتهى بامتحان شامل فى نهاية كل أربع فصول دراسية بعد اجتياز الطالب امتحانات

الجزء الأول بنجاح يسمح له بتسجيل رسالة لمدة أربعة فصول دراسية تبدأ عند بداية الفصل الدراسى الثانى وتناقش بعد مرور

عامين على الأقل من تاريخ تسجيل الرسالة على أن تكون المناقشة بعد ستة اشهر على الأقل مع اجتياز الامتحان التحريرى

والإكلينيكية والشفهى ( الامتحان الشامل ) .

يمنح الطالب الدرجة بعد مناقشة الرسالة واجتياز الامتحان الشامل .

• يكون التقدم للقيده لدرجة الدكتوراه مرتين فى السنة خلال شهرى مارس وأكتوبر من كل عام .

6 - القواعد المنظمة لإستكمال البرنامج :

مادة ( ٢٤ ) : يشترط فى الطالب لنيل درجة الدكتوراه فى الطب أو الجراحة أو العلوم الطبية الأساسية ما يلى :

• حضور المقررات الدراسية بصفة مرضية طبقا للساعات المعتمدة .

• أن يقوم ببحث فى موضوع تقره الجامعة بعد موافقة مجلس الكلية والقسم لمدة سنتان على الأقل .

• أن يتقدم بنتائج البحث فى رسالة تقبلها لجنة الحكم بعد مناقشة علنية للرسالة .

• اجتياز الطالب ثلاث دورات فى الحاسب الآلى ( دورة فى مقدمة الحاسب الآلى - دورة تدريبية " متوسطة " - دورة فى

تطبيقات الحاسب الآلى ) . وذلك قبل مناقشة الرسالة .

• اجتياز الطالب اختبار التوفيل بمستوى لا يقل عن ٥٠٠ وحدة وذلك قبل مناقشة الرسالة .

• أن يجتاز بنجاح الاختبارات التحريرية والإكلينيكية والشفهية المقررة وفقا لما هو مبين باللائحة .

مادة ( ٢٥ ) : على الطالب أن يقيد اسمه للامتحان قبل موعده بشهر على الأقل .

مادة ( ٢٦ ) : يشترط لنجاح الطالب فى امتحان الدكتوراه الحصول على الحد الأدنى للنجاح فى جميع الاختبارات المقررة وفى كل جزء

من أجزاءها على حدة ذلك بأخذ المتوسط لتقديرات أعضاء اللجنة اذا رسب الطالب فى أى مقرر من المقررات بعد الامتحان

فى جميع المقررات .

مادة ( ٢٧ ) : يعقد الامتحان التحريرى لدرجة الدكتوراه فى شهرى نوفمبر ومايو من كل عام - لمن يجتاز الامتحان التحريرى فى نفس

الدور يتقدم الامتحان الشفهى والاكلينكى والعملى

مادة ( ٢٨ ) : لا يجوز للطالب أن يبقى مقيدا لدرجة الدكتوراه لأكثر من أربع سنوات دون أن يتقدم لمناقشة الرسالة ويجوز لمجلس

الكلية أن يعطى الطالب مهلة لمدة سنتين فى حالة قبول العذر .

مادة ( ٢٩ ) : تضاف درجات التحريرى ووصف الحالة لبعضها ويعتبر النجاح والرسوب فى المجموع الكلى للتحريرى ( ٦٠% على



الاقبل من الدرجة النهائية ( للتحريرى ) ومن ينجح فى الامتحان التحريرى يصرح له بدخول باقى الامتحانات الإكلينيكية

والشفوية والعملية وعدد الرسوب يعيد الطالب الامتحان الشفوى والاكلينيكى

لا يحق للطلاب التقدم لامتحان التحريرى أكثر من أربع مرات

مادة ( ٣٠ ) : تبين فى شهادة الدكتوراة موضوع الرسالة والمادة أو المواد الاختيارية

مادة ( ٣١ ) : تبين الجداول فى الباب الخامس المقررات الدراسية التى تدرس لنيل درجة الدكتوراه طبقا للساعات المعتمدة الاختبارات

التحريرية والإكلينيكية والشفوية

### - محتويات المقررات (راجع توصيف المقررات ملحق ٦)

• كود أو رقم المقرر : PHAR 701 ,PHAR 702

• اسم المقرر : Basic and applied pharmacology

• المحتويات:

البند	المقررات	الكود	الساعات المعتمدة
١	*دراسات نظرية وعملية: تشمل: مناهج إجبارية		٢٦ ساعة
	١- دراسة التطورات الحديثة وكذلك المنظور المستقبلي المتوقع -أسس علم الفارماكولوجي. -فارماكولوجيا الأجهزة الحيوية والمواد الفعالة بالجسم. - الفارماكولوجيا الجزيئية - مضادات العدوي وعلاج الأورام - الفيتامينات ومضادات الأكسدة - فارماكولوجيا المناعة - فارماكولوجيا الجينات - التداخل الدوائي	PHAR 701	١٠ ساعات
	٢- الفارماكولوجيا الإكلينيكية : -المستحدث والمتوقع في علاج مختلف الأمراض -فارماكولوجيا الطفولة والشيخوخة. - فارماكولوجيا الحمل والرضاعة - تأثير الأمراض علي حركية الدواء	PHAR 702	١٠ ساعات





١٠ ساعات بواقع ٢ ساعة معمدة لكل نشاط		<b>*مراعاة الأنشطة:</b>	٢
		١- تقديم عدد (٢) سيمينار . ٢- تقديم عدد (٢) نادي دوريات . ٣- تقديم بروتوكول بحث لحل مشكلة فارماكولوجية . ٤- حضور أربعة مؤتمرات علمية . ٥- حضور دورة تدريبية أو ورشة عمل خارج القسم .	
٣٠ ساعة		رسالة الدكتوراه في الفارماكولوجي	٣
٦٠ ساعة معمدة		المجموع	

### ٧- طرق وقواعد تقييم المتحقيين بالبرنامج :

#### 7-Students Assessment Methods:

مخرجات التعلم المستهدفة	الوسيلة	م
To assess knowledge and understanding and intellectual skills <b>2.a.1 , 2.a .2 , 2.a.3 , 2.a.4 ,2.a.5 , 2.a.6 , 2.b.1 , 2.b.2 , 2.b.5 ,2.b.6,2.b.7 ,2.b.8 , 2.b.6- 2.b.9</b>	Written examination	
To assess knowledge, intellectual skills & General & transferable skills: <b>2.a.1 , 2.a .2 , 2.a.6 , 2.b.1 , 2.b.2 , 2.b.5 , 2.b.6,2.b.7 ,2.b.8 , 2.b.6- 2.b.9 , 2.d.1 ,2.d.2 ,2.d.3 ,2.d.4 ,2.d.5 ,2.d.6 ,2.d.7</b>	Oral examination	
To assess practical skills, knowledge and understanding and intellectual skills, general skills: <b>2.c.1. , 2.c.2 , 2.c.3, 2.c.4 ,2.c.5 , 2.c.6 ,2.c.7, 2.c.8</b>	Practical examination	
<b>2.a.1 , 2.a .2 , 2.a.6 , 2.b.1 , 2.b.2 , 2.b.5 , 2.b.6,2.b.7 ,2.b.8 2.b.6- 2.b.9 , 2.d.1 ,2.d.2 ,2.d.3 ,2.d.4 ,2.d.5 ,2.d.6 ,2.d.7 , 2.c.1. , 2.c.2 , 2.c.3, 2.c.4 ,2.c.5 , 2.c.6 ,2.c.7, 2.c.8</b>	Thesis	



## Final exam.

### First part

إجمالي	الدرجة				الاختبار	المقرر
	نشاط	عملي	نظري	تحريري		
	١٠٠	٢٠٠	٢٠٠	٥٠٠	اختبار تحريري مدته ثلاث ساعات + اختبار نظري	Basic pharmacology
١٠٠٠	إجمالي الدرجة					

### Second part

إجمالي	الدرجة				الاختبار	المقرر
	عملي	نشاط	نظري	تحريري		
	٥٠٠	١٠٠	٤٠٠	٥٠٠	اختباران تحريريان مدة كل منهما ثلاث ساعات + اختبار نظري + اختبار إكلينيكي	Applied pharmacology
٢٠٠٠	إجمالي الدرجة					

8 - طرق تقويم البرنامج :

### 8- Evaluation of Program:

Evaluator	Tools	Signature
Internal evaluator (s) مقيم داخلي	Focus group discussion Meetings	<u>1-2 reports</u>
External Evaluator (s) مقيم خارجي	Reviewing according to external evaluator checklist report.	<u>1-2 reports</u>
Senior student (s) طلاب السنة النهائية	none	<u>all</u>
الخريجون Alumni	none	50%
Stakeholder (s) أصحاب العمل	none	<u>From all sectors</u>
Others طرق أخرى	none	



١١ : استراتيجيات التعليم و التعلم علي مستوي البرنامج:

١. استراتيجية التعلم النشط. **Active learning**
٢. استراتيجية التعليم المبني على النتائج. **Outcome-based learning**
٣. استراتيجية التعليم المبني على حل المشكلات. **Problem-based learning**

**Program Coordinator: Name Dr /Mohanad Mohmaed Ibrahim Shehab**

**Signature Mohanad Mohmaed Ibrahim Shehab**

**Date 9/2013**



## توصيف المقررات

### Program courses

*Benha University*  
*Faculty of Medicine*  
*Department of Clinical Pharmacology*

## *Course Specification*

Course title: Basic Pharmacology

(Code): **PHAR 701**

Academic Year (2013 – 2014)

### 1- Basic Information:

- Department offering the course: **Clinical Pharmacology Department**
- Academic year of MD. program: **2013\_2014.**
- Major or minor elements of the program: **Major.**
- Academic level: **first part**
- Date of specification approval: Department council , date **/9 / 2013 .**
- Allocated marks: **1000** marks
- Course duration: **15** weeks of teaching
- Teaching hours: **16** hours/week = **240** total teaching hours

	<b>Total hours</b>
<b>1- lectures</b>	105h
<b>2- practical</b>	135 h
<b>Total</b>	240h

### 2- Overall Aim of the Course:

- To provide the advanced knowledge about commonly used groups of drugs affecting different body systems and their implications in therapy of diseases and health



promotion.

### **3- Intended Learning Outcomes (ILOs):**

#### **2.a Knowledge and understanding:**

*By the end of the course, students should be able to:*

- 2.a.1. Discuss the pharmacokinetic, pharmacodynamic and pharmacotherapeutic properties of different groups of drugs affecting body systems.
- 2.a.2. Mention the adverse and toxic effects, and their management of commonly used groups.
- 2.a.3. Enumerate limitations to the use of drugs such as contraindications and drug interactions.
- 2.a.4. Define clinically relevant age, sex and genetic related variations that affect response to drugs.
- 2.a.5. Describe the pathophysiology of diseases and explain the rational basis for the use of drugs.
- 2.a.6. Tell the impact of preventive pharmacology in promoting health and prevent illness.
- 2.a.7. List the principles, the indications, the relative advantage and disadvantages of various pharmacotherapy modalities.
- 2.a.8. Memorize the use of life saving drugs.
- 2.a.9. Discuss the role, prevalence and limitations of alternative and complementary therapies/commonly in use.
- 2.a.10. Write the principles and applications of gene therapy.
- 2.a.11. Recognize the rational and general guidelines of the use drugs in the proper dose in special population such as pediatrics, geriatrics, pregnancy and lactation and in cases of liver and kidney impairment.
- 2.a.12. Define the basis of pharmaco-economics.

#### **2.b. Intellectual Skills:**

*By the end of the course, students should be able to:*

- 2.b.1. Calculate accurately drug's dosage, bioavailability, plasma half life and volume of distribution in different patient populations.
- 2.b.2. Construct rational therapeutic strategies for both acute and chronic conditions that take into account the various variables that influence these strategies. Choose the proper drug(s) for the proper clinical situation in proper dosage.

#### **2.b. Practical and Clinical Skills**

*By the end of the course, students should be able to:*

- 2.c.1. Perform with precision different technique of drug administration.
  - 2.c.2. Report the effectiveness and toxicity of therapy.
  - 2.c.3. Perform chromatographic measurement.
- Obtain and record a comprehensive drug history of the patient.



2.c.4. Document drug adverse reactions

**2.d. General and transferable Skills:**

*By the end of the course, students should be able to:*

- 2.d.1. Demonstrate respect to all patients irrespective of their socioeconomic levels, culture or religious beliefs and use language appropriate to the patient's culture.
- 2.d.2. Provide appropriate basic drug education to the patient and his family.
- 2.d.3. Communicate effectively with other health care professionals to maximize patient benefits and minimize the risk of errors.

**4- Course contents:**

	Course	Tutorial /Small group discussion hours	Practical hours	Total hours
First part	<b>Basic Pharmacology II</b> 1.Basic pharmacology.	40	70	110
	2.Molecular pharmacology.	15	20	35
	3. Anti microbial & cancer chemotherapy	30	10	40
	4.Vitamins and food supplements	5	-	5
	5.Immunopharmacology.	10	10	20
	6.Pharmacogenetics.	5	10	15
	7.Drug interactions	5	15	20
Total		105	135	240

**5- Teaching and learning methods:**

**METHODS USED:**

5.1 – modified Lectures and discussions, problem solving



5.2- Practical modules

**6- Teaching and learning methods for students with limited capabilities:**

**7- Students Assessment methods:**

**7.A) Attendance Criteria:**

1. Practical attendance.
2. Log book.

**7.B) Assessment Tools:**

Tool	Purpose (ILOS)
Written examination	To assess knowledge, understanding and intellectual skills including MCQs and problem solving.
Oral examination	To assess knowledge, understanding intellectual skills and, attitude and presentation.
Practical examination	To assess practical skills knowledge, understanding intellectual skills and, attitude and presentation.

**7.C) TIME SCHEDULE:**

Exam	Week
1- First part exam	After 1 1/2 years from first part
2- Thesis	After 2 years from protocol registration

**7-D) Weighting system:**

written exams.	50 %
Oral Examination	20 %
Practical Examination	20 %
Semester Work	10 %
Other types of Assessment	
Total	100%

**FORMATIVE ASSESSMENT:**

Student knows his marks after the Formative exams.



## **7-E) Examinassions description:**

### **Second part:**

Assessment(1): 2 written exams. (3hr each)

Assessment (2): Practical modules.

Assessment (3): Oral examination.

## **8- List of references:**

### 8.A Postgraduate Course Notes:

- Handouts updated administered by staff members

### 8.B Essential Books (Text Books):

- David E. Golan; Armen H. Tashjian; Ehrin J. and Armstrong et al.(2009): Principles of pharmacology: the pathophysiologic basis of drug [et al.], Philadelphia : Lippincott Williams & Wilkins.

### 8.C- Recommended Books:

- GOODMAN AND OILMAN(2011): THE PHARMACOLOGICAL BASIS OF THERAPEUTICS 13<sup>th</sup> edition.

### 8.D- web Sites:

[www.micromedex.co](http://www.micromedex.co)

**Course Coordinator: Prof. Dr.Mohanad Mohamed Ibrahim Shehab**

**Head of Department: Prof. Dr. Ahmed selim mohammed**

**Date: /9/2013**





*Benha University*  
*Faculty of Medicine*  
*Department of Clinical Pharmacology*

## *Course Specification*

Course title: Applied Pharmacology

(Code): **PHAR 702**

Academic Year (2013– 2014)

### **1- Basic Information:**

- Department offering the course: **Clinical Pharmacology Department**
- Academic year of MD. program: **2012\_2013.**
- Major or minor elements of the program: **Major.**
- Academic level: **second part.**
- Date of specification approval: Department council , date **/9 / 2013 .**
- Allocated marks: 2000 marks
- Course duration: **45 weeks of teaching**
- Teaching hours: **16 hrs/week = 720 total teaching hours**

	<b>Total hours</b>
<b>1- lectures</b>	315 h
<b>2- practical</b>	405 h
<b>Total</b>	720 h

### **2- Overall Aim of the Course:**

- To provide the advanced knowledge about commonly used groups of drugs affecting different body systems and their implications in therapy of diseases and health promotion.

### **3- Intended Learning Outcomes (ILOs):**

#### **2.a Knowledge and understanding:**

*By the end of the course, students should be able to:*



- 2.a.1. Discuss the pharmacokinetic, pharmacodynamic and pharmacotherapeutic properties of different groups of drugs affecting body systems.
- 2.a.2. List the adverse and toxic effects, and their management of commonly used groups.
- 2.a.3- Mention limitations to the use of drugs such as contraindications and drug interactions.
- 2.a.4. Define clinically relevant age, sex and genetic related variations that affect response to drugs.
- 2.a.5. Memorize the pathophysiology of diseases and explain the rational basis for the use of drugs.
- 2.a.6. Discuss the impact of preventive pharmacology in promoting health and prevent illness.
- 2.a.7. List the principles, the indications, the relative advantage and disadvantages of various pharmacotherapy modalities.
- 2.a.8- Discuss the use of life saving drugs.
- 2.a.9- Describe the role, prevalence and limitations of alternative and complementary therapies/commonly in use.
- 2.a.10. Outline the principles and applications of gene therapy.
- 2.a.11. Describe the rational and general guidelines of the use of drugs in the proper dose in special population such as pediatrics, geriatrics, pregnancy and lactation and in cases of liver and kidney impairment.
- 2.a.12. Define the basis of pharmaco-economics.
- 2.a.13. Identify dental pharmacology.
- 2.a.14. Recognize the evaluation and development of drugs.

## **2.b. Intellectual Skills:**

*By the end of the course, students should be able to:*

- 2.b.1- Calculate accurately drug's dosage, bioavailability, plasma half life and volume of distribution in different patient populations.
- 2.b.2. Evaluate old and new drugs.
- 2.b.3 Construct rational therapeutic strategies for both acute and chronic conditions that take into account the various variables that influence these strategies. Choose the proper drug(s) for the proper clinical situation in proper dosage.

## **2.c. Practical and Clinical Skills**

*By the end of the course, students should be able to:*

- 2.c.1- Perform with precision different technique of drug administration.
- 2.c.2- Report the effectiveness and toxicity of therapy.
- 2.c.3- Use chromatographic measurement.
- 2.c.4- Make electric and electronic measurement of brain, nerves and muscles activities.
- 2.b.5- Obtain and record a comprehensive drug history of the patient.
- 2.b.6. Document drug adverse reactions.



2.b.4. Observe, record and analyze the effect of drugs on biological tissues.

## 2.d. General and transferable Skills:

*By the end of the course, students should be able to:*

- 2.d.1- Demonstrate respect to all patients irrespective of their socioeconomic levels, culture or religious beliefs and use language appropriate to the patient's culture.  
2.d.2- Provide appropriate basic drug education to the patient and his family.  
2.d.3- Communicate effectively with other health care professionals to maximize patient benefits and minimize the risk of errors.  
2.d.4- show a strong commandment to the importance of life-long self-learning  
2.d.5- Use current IT. for appropriate drug database to reach information about a specific medication.

## 4- Course contents:

	Course	Tutorial /small group discussion hours	Practical hours	Total hours
Second part	<b>Clinical Pharmacology</b> - New & expected treatment in different diseases.	<b>225</b>	<b>125</b>	<b>350</b>
	- Pediatrics & geriatrics pharmacology.	<b>35</b>	<b>30</b>	<b>65</b>
	- Pregnancy and lactation pharmacology.	<b>20</b>	-	<b>20</b>
	- Effect of disease on pharmacokinetic of drugs	<b>35</b>	<b>50</b>	<b>85</b>



Activities	- Seminar. (2) - journal club.(2) -Protocol in solving pharmacological problem. -Attendance of 4 different scientific activities. - Attendance of work shop out side pharmacology department		100	100
Thesis	For M.D degree in pharmacology		100	100
Total			315	405

**5- Teaching and learning methods:****METHODS USED:**

5.1 – Lectures

5.2- Practical modules

**TEACHING PLAN:**

Item	Time schedule	Teaching hours	Total hours
Lectures	3 times/ weeks 1.5 hours each	7 hours/week for 45 weeks	315 h
Practical	3 times/ week 3 hours each	9 hours/ week for 45 weeks	405
Activities	4 times/ week 2.5 hours each	10 hours/ week for 45 weeks	450 h
Thesis	6 time/ week 5 hours each	30 hours/week for 45 weeks	1350 h
Total			2250 h

**6- Teaching and learning methods for students with limited capabilities:****7- Students Assessment methods:**



**7.A) Attendance Criteria:**

1. Practical attendance.
2. Log book.

**7.B) Assessment Tools:**

Tool	Purpose (ILOS)
Written examination	To assess knowledge, understanding and intellectual skills including MCQs and problem solving.
Oral examination	To assess knowledge, understanding intellectual skills and, attitude and presentation.
Practical examination	To assess practical skills knowledge, understanding intellectual skills and, attitude and presentation.

**7.C) TIME SCHEDULE:**

Exam	Week
1- Second part exam	After 1 1/2 years from first part
2- Thesis	After 2 years from protocol registration

**7-D) Weighting system:**

written exams.	50 %
Oral Examination	20 %
Practical Examination	30 %
Semester Work	10 %
Other types of Assessment	
Total	100%

**FORMATIVE ASSESSMENT:**

Student knows his marks after the Formative exams.

**7-E) Examinations description:**

**Second part:**

- Assessment(1): 2 written exams. (3hr each)  
Assessment (2): Practical modules.  
Assessment (3): Oral examination.



### ***8- List of references:***

#### 8.A Postgraduate Course Notes:

- Handouts updated administered by staff members

#### 8.B Essential Books (Text Books):

- David E. Golan; Armen H. Tashjian; Ehrin J. and Armstrong et al.(2009): Principles of pharmacology: the pathophysiologic basis of drug [et al.], Philadelphia : Lippincott Williams & Wilkins.

#### 8.C- Recommended Books:

- GOODMAN AND OILMAN'S(2011): THE PHARMACOLOGICAL BASIS OF THERAPEUTICS 12<sup>th</sup> edition.
- Katzung : the pharmacological basis of therapeutics 12<sup>th</sup> edition 2012.

#### 8.D- web Sites:

[www.micromedex.co](http://www.micromedex.co)

**Course Coordinator: Prof. Dr. Mohaned Mohammed Ibrahim Shehab**

**Head of Department: Prof Dr:Ahmed Selim Mohamed**

**Date: /9/2013**

**ملحق ١: Academic standard of the program**

جامعة بنما

كلية الطب

قسم الطب السريري و السموم الأكلينيكية

**وثيقة المعايير الأكاديمية المرجعية لبرنامج الدكتوراة**

**Academic Reference Standards (ARS) for MD Degree in  
Clinical pharmacology**

**Academic standards of the program :**

**1- Graduate attributes:**

- 1.1 Master the principles of scientific research in the field of drugs.
- 1.2. Sincerely attempt to add to human knowledge in the field of pharmacology.
- 1.3. Deal with and processing of knowledge in the field of pharmacology and related basic sciences (physiology , Pathology , bacteriology) in a manner based on constrictive criticism and thorough analysis.
- 1.4. Process of pharmacological knowledge and integrate them with other relevant sciences to be applicable in other clinical sciences ( surgery , medicine , anesthesiology , gynecology , obstetrics, pediatrics ).
- 1.5. Aware of hot point of research as regards drug therapy and main theories in pharmacology.
- 1.6. Assign possible technical problem that may be encountered during research and trying to resolve them.
- 1.7. Master a wide range of research tools employed in pharmacology.
- 1.8. Sincerely attempt to improve methods of practicing all aspects of pharmacology regarding teaching, research and providing consultations about drug therapy.
- 1.9. Be acquainted with the appropriate technical methods required to improve his professional practice in pharmacology
- 1.10. Effective communication and adequate leadership of team work in various situations during practicing pharmacology( teaching , research and consulting).
- 1.11. Make appropriate conclusions in pharmacological practice based on available data.
- 1.12. Effective employments of available resources (lab equipments , teaching facilities , personells) and trying to create new ones.

1.13. understanding the role of good practice in pharmacology as regards wise prescription of drugs and awareness of side effects and environmental hazards associated with exposure to chemicals and drugs on development of community and environmental preservation

1.14. Practice pharmacology either as teacher, researcher or consultant with extreme degrees of credibility, transparency and commitment with ethics.

1.15. Pledge to self improve his practice in pharmacology and transfer his knowledge in pharmacology to others.

## **2- Academic standards:**

### **2.1. Knowledge and understanding:**

***By the end of the program, the candidate should be able to:***

2.1.1. Clearly explain the fundamental aspects of mechanism of action of drugs in cellular, subcellular and molecular levels, Pharmacokinetic facts, adverse drug as well as related domains of other medical sciences namely physiology, pathology, microbiology, parasitological.

2.1.2. Understand the fundamentals required to perform adequate research in the field of pharmacology as regards methodology and ethics.

2.1.3. Review the moral and ethical principles of drug experimentation in animals and humans.

2.1.4. Proper choice of research tools to obtain precise knowledge of about drugs.

2.1.5. Estimate of the expected environmental hazards associated with handling of drugs for the purpose of research or therapy.

٢-٢ القدرات الذهنية :

### **2.3. Intellectual Skills:-**

***By the end of the program the graduate should be able to:***

2.2.1. Infer generalizations related to optimal use of drugs based on categorization evaluation and analysis of the information obtained from research work on drug kinetics and action.

2.2.2. Employ research results in resolving medical problems associated with drug use as regards drug efficacy, adverse effects and interaction with other drugs.

2.2.3. Make a research plan to investigate the biological properties of particular substance and possible use in treatment of diseases.



- 2.2.4. Design a plan for scientific research papers based on sound research work related to main issues in pharmacology.
- 2.2.5. Predict and evaluate the hazards related to drug research as regards dealing with drugs and animals and patients
- 2.2.6. Improve research tools in pharmacology and develop new ones aiming at better screening of biological effects of drugs and chemicals , exploring their advantages and disadvantages compared with prototype drugs , its interactions with other drugs and their role in therapeutic plan to treat specific diseases..
- 2.2.7. Make decisions to solve drug related health problems.
- 2.2.8. Create and invent new research methods in pharmacology.
- 2.2.9. Defend his Interpretations on research results based on logic evidences and proofs.

٣-٢ - مهارات مهنية وعملية:

### **2.3. Practical & Clinical Skills:-**

**By the end of the program, the graduate should be able to:**

- 2.3.1-Master basic and advanced skills in pharmacology.
- 2.3.2. Write and evaluate scientific reports about the use and effect of drugs .
- 2.3.3. Manipulate research techniques and equipments in pharmacology for use in various situations encountered during research.
- 2.3.4. Employ technical facilities to improve practice of pharmacology in the field of research ,teaching and providing consultations.
- 2.3.5. Improve practice in the field of pharmacology and improve the skills of other medical personellsas regards optimal drug in pharmacology and other related medical specialties.

٤-٢ . مهارات عامة :

### **2-4- General and transferable skills:**

**By the end of the program the graduate will be able to:**

- 2.4.1. Efficiently communicate with target categories either students ,colleagues , medical and paramedical personells , research authorities and common people
- 2.4.2. Utilize information technology in improving practice of pharmacology.
- 2.4.3. Transfer appropriate knowledge in the field of pharmacology to different categories of target personells and evaluate their performance.
- 2.4.4. Construct a plan for self evaluation and continuous learning.
- 2.4.5. Utilize available sources of knowledge in pharmacology and related sciences .

2.4.6. Work in a team and lead a team .

2.4.7. Operate scientific meetings and proper time utilization.

اعتماد مجلس القسم رقم ، بتاريخ . 2013.../6.

مجلس الكلية ٣٥٤ ٢٠١٣/٦/١٦

رئيس مجلس القسم

## ملحق ٢: المعايير القياسية العامة للدراسات العليا الصادرة عن الهيئة.

### ١ - المعايير القياسية

#### ١-٢ المعرفة والفهم

- بانتهاج دراسة برنامج الدكتوراه يجب ان يكون الخريج قادرا على الفهم والدراية بكل من
- ١-١-٢ النظريات والاساسيات والحديث من المعارف فى مجال التخصص والمجالات ذات العلاقة
  - ٢-١-٢ اساسيات ومنهجيات واخلاقيات البحث العلمى وادواته المختلفة
  - ٣-١-٢ المبادئ الاخلاقية والقانونية للممارسة المهنية فى مجال التخصص
  - ٤-١-٢ مبادئ واساسيات الجودة فى الممارسة فى مجال التخصص
  - ٥-١-٢ المعارف المتعلقة بأثار ممارسته المهنية على البيئة وطرق تنمية البيئة وصيانتها

#### ٢-٢ المهارات الذهنية

- بانتهاج دراسة برنامج الدكتوراه يجب ان يكون الخريج قادرا على
- ١-٢-٢ تحليل وتقييم المعلومات فى مجال التخصص والقياس عليها والاستنباط منها
  - ٢-٢-٢ حل المشاكل المتخصصة استنادا على المعطيات المتاحة
  - ٣-٢-٢ اجراء دراسات بحثية تضيف الى المعارف
  - ٤-٢-٢ صياغة أوراق علمية
  - ٥-٢-٢ تقييم المخاطر فى الممارسات المهنية
  - ٦-٢-٢ التخطيط لتطوير الاداء فى مجال التخصص
  - ٧-٢-٢ اتخاذ القرارات المهنية فى سياقات مهنية مختلفة
  - ٨-٢-٢ الابتكار/الابداع
  - ٩-٢-٢ الحوار والنقاش المبني على البراهين والادلة

#### ٣-٢ المهارات المهنية

- بانتهاج دراسة برنامج الدكتوراه يجب ان يكون الخريج قادرا على
- ١-٣-٢ اتقان المهارات المهنية الاساسية والحديثة فى مجال التخصص
  - ٢-٣-٢ كتابة وتقييم التقارير المهنية
  - ٣-٣-٢ تقييم وتطوير الطرق والادوات القائمة فى مجال التخصص
  - ٤-٣-٢ استخدام الوسائل التكنولوجية بما يخدم الممارسة المهنية
  - ٥-٣-٢ التخطيط لتطوير الممارسة المهنية وتنمية اداء الاخرين

#### ٤-٢ المهارات العامة والمنتقلة

- بانتهاج دراسة برنامج الدكتوراه يجب أن يكون الخريج قادرا على
- ١-٤-٢ التواصل الفعال بأنواعه المختلفة
  - ٢-٤-٢ استخدام تكنولوجيا المعلومات بما يخدم تطوير الممارسة المهنية
  - ٣-٤-٢ تعليم الاخرين وتقييم ادائهم
  - ٤-٤-٢ التقييم الذاتى والتعليم المستمر
  - ٥-٤-٢ استخدام المصادر المختلفة للحصول على المعلومات والمعارف
  - ٦-٤-٢ العمل فى فريق وقيادة فرق العمل
  - ٧-٤-٢ ادارة اللقاءات العلمية والقدرة على ادارة الوقت

ملحق ٣: Benchmarks (المعايير المرجعية الخارجية)

ملحق ٤: مصفوفة المعايير الأكاديمية للبرنامج مع المعايير القياسية للدراسات العليا الصادرة عن الهيئة

- مواصفات الخريج:

مواصفات الخريج بالمعايير الأكاديمية للبرنامج	مواصفات الخريج بالمعايير القياسية للدراسات العليا
1.1. Master the principles of scientific research in the field of drugs.	٢- مواصفات الخريج : ١-١ إتقان أساسيات ومنهجيات البحث العلمي
1.2. Sincerely attempt to add to human knowledge in the field of pharmacology.	٢-١ العمل المستمر على الإضافة للمعارف في مجال التخصص
1.3. Deal with and processing of knowledge in the field of pharmacology and related basic sciences (physiology , Pathology , bacteriology) in a manner based on constrictive criticism and thorough analysis.	٣-١ تطبيق المنهج التحليلي والناقد للمعارف في مجال التخصص والمجالات ذات العلاقة
1.4. Process of pharmacological knowledge and integrate them with other relevant sciences to be applicable in other clinical sciences ( surgery , medicine , anesthesiology , gynecology , obstetrics, pediatrics ).	٤-١ دمج المعارف المتخصصة مع المعارف ذات العلاقة مستنبطاً ومطوراً للعلاقات البينية بينها
1.5. Aware of hot point of research as regards drug therapy and main theories in pharmacology.	٥-١ اظهار وعيا عميقا بالمشاكل الجارية والنظريات الحديثة في مجال التخصص
1.6. Assign possible technical problem that may be encountered during research and trying to resolve them.	٦-١ تحديد المشكلات المهنية ويجاد حلولاً مبتكرة لحلها

1.7.Master a wide range of research tools employed in pharmacology.	٧-١- إتقان نطاقا واسعا من المهارات المهنية في مجال التخصص
1.8.Sincerely attempt to improve methods of practicing all aspects of pharmacology regarding teaching, research and providing consultations about drug therapy.	٨-١- التوجه نحو تطوير طرق وادوات واساليب جديدة للمزاولة المهنية
1.9.Beeing acquainted with the appropriate technical methods required to improve his professional practice in pharmacology	٩-١- استخدام الوسائل التكنولوجية المناسبة بما يخدم ممارسة المهنة
1.10. Effective communication and adequate leadership of team work in various situations during practicing pharmacology( teaching , research and consulting).	١٠-١- التواصل بفاعلية وقيادة فريق عمل في سياقات مهنية مختلفة
1.11. Make appropriate conclusions in pharmacological practice based on available data.	١١-١- اتخاذ القرار في ضل المعلومات المتاحة
1.12.Effective employments of available resources (lab equipments , teaching facilities , personells) and trying to create new ones.	١٢-١- بكفاءة وتنميتها والعمل على توظيف الموارد المتاحة ايجاد موارد جديدة
1.13.understanding the role of good practice in pharmacology as regards wise prescription of drugs and awareness of side effects and environmental hazards associated with exposure to chemicals and drugs on development of community and environmental preservation	١٣-١- الوعي بدوره في تنمية المجتمع والحفاظ على البيئة
1.14.Practce pharmacology either as teacher , researcher or consultant with extreme degrees of credibility , transparency and commitment with ethics.	١٤-١- التصرف بما يعكس الالتزام بالنزاهة والمصداقية وقواعد المهنة

1.15.Pledge to self improve his practice in pharmacology and transfer his knowledge in pharmacology to others .

١٥-١ الالتزام بالتنمية الذاتية  
المستمرة ونقل علمه وخبراته للآخرين

أ - المعرفة والفهم:

المعايير الأكاديمية للبرنامج	المعايير القياسية العامة (Generic) للدراسات العليا
2.1-1.Clearly explain the fundamental aspects of mechanism of action of drugs in cellular , subcellular and molecular levels , Pharmacokinetic facts , adverse drug as well as related domains of other medical sciences namely physiology , pathology , microbiology , parasitological.	١-١-٢ النظريات والاساسيات والحديث من المعارف في مجال التخصص والمجالات ذات العلاقة
2.1.2.Understand the fundamentals required to perform adequate research in the field of pharmacology as regards methodology and ethics .	٢-١-٢ اساسيات ومنهجيات و اخلاقيات البحث العلمى وادواته المختلفة
2.1.3. Review the moral and ethical principles of drug experimentation in animals and humans.	٣-١-٢ المبادئ الاخلاقية والقانونية للممارسة المهنية في مجال التخصص
2.1.4. Proper choice of research tools to obtain precise knowledge of about drugs.	٤-١-٢ مبادئ واساسيات الجودة في الممارسة في مجال التخصص

2.1.5. Predict and evaluate the hazards related to drug research as regards dealing with drugs and animals and patients

٥-١-٢ المعارف المتعلقة بأثار  
ممارسته المهنية على البيئة وطرق تنمية  
البيئة وصيانتها

ب - القدرات الذهنية :

المعايير الأكاديمية للبرنامج	المعايير القياسية العامة (Generic) للدراسات العليا
2.2.1. Infer generalizations related to optimal use of drugs based on categorization evaluation and analysis of the information obtained from research work on drug kinetics and action .	١-٢-٢ تحليل وتقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل
2.2.2. Employ research results in resolving medical problems associated with drug use as regards drug efficacy , adverse effects and interaction with other drugs.	٢-٢-٢ حل المشاكل المتخصصة استنادا على المعطيات المتاحة
2.2.3. Make a research plan to investigate the biological properties of particular substance and possible use in treatment of diseases.	٣-٢-٢ اجراء دراسات بحثية تضيف الى المعارف
2.2.4. Design a plan for scientific research papers based on sound research work related to main issues in pharmacology.	٤-٢-٢ صياغة أوراق علمية
2.2.5. Predict and evaluate the hazards related to drug research as regards handling experimental animals , exposure to drugs or chemicals used in drug research .	٥-٢-٢ تقييم المخاطر في الممارسات المهنية

2.2.6. Improve research tools in pharmacology and develop new ones aiming at better screening of biological effects of drugs and chemicals , exploring their advantages and disadvantages compared with prototype drugs , its interactions with other drugs and their role in therapeutic plan to teat specific diseases..	٦-٢-٢ التخطيط لتطوير الاداء فى مجال التخصص
2.2.7. Make decisions to solve drug related health problems..	٧-٢-٢ اتخاذ القرارات المهنية فى سياقات مهنية مختلفة
2.2.8. Create and invent new research methods in pharmacology.	٨-٢-٢ الابتكار/الابداع
2.2.9. Defend his Interpretations on research results based on logic evidences and proofs.	٩-٢-٢ الحوار والنقاش المبني على البراهين والادلة

ج. مهارات مهنية وعملية :

المعايير الأكاديمية للبرنامج	المعايير القياسية العامة (Generic) للدراسات العليا
2.3.1.Master basic and advanced skills in pharmacology.	١-٣-٢ اتقان المهارات المهنية الاساسية والحديثة فى مجال التخصص
2.3.2.Write and evaluate scientific reports about the use and effect of drugs .	٢-٣-٢ كتابة وتقييم التقارير المهنية
2.3.3.Manipulate research techniques and equipments in pharmacology for use in various situations encountered during research.	٣-٣-٢ تقييم وتطوير الطرق والادوات القائمة فى مجال التخصص



<p>2.3.4. Employ technical facilities to improve practice of pharmacology in the field of research ,teaching and providing consultations.</p>	<p>٢-٣-٤ استخدام الوسائل التكنولوجية بما يخدم الممارسة المهنية</p>
<p>2.3.5. Improve practice in the field of pharmacology and improve the skills of other medical personellsas regards optimal drug in pharmacology and other related medical specialties.</p>	<p>٢-٣-٥ التخطيط لتطوير الممارسة المهنية وتنمية اداء الاخرين</p>

د . مهارات عامة و منتقلة :

<p>المعايير الأكاديمية للبرنامج</p>	<p>المعايير القياسية العامة (Generic) للدراسات العليا</p>
<p>2.4.1. Efficiently communicate with categories either students ,colleges , medical paramedical personells , research authorities common people.</p>	<p>٢-٤-١ التواصل الفعال بأنواعه المختلفة</p>
<p>2.4.2. Utilize information technology in improving practice of pharmacology.</p>	<p>٢-٤-٢ استخدام تكنولوجيا المعلومات بما يخدم تطوير الممارسة المهنية</p>
<p>2.4.3. Transfer appropriate knowledge in the field of pharmacology to different categories of target personells and evaluate their performance.</p>	<p>٢-٤-٣ تعليم الاخرين وتقييم ادائهم</p>

2.4.4. Construct a plan for self evaluation and continuous learning.	٤-٤-٢ التقييم الذاتي والتعليم المستمر
2.4.5. Utilize available sources of knowledge in pharmacology and related sciences .	٥-٤-٢ استخدام المصادر المختلفة للحصول على المعلومات والمعارف
2.4.6. Work in a team and lead a team .	٦-٤-٢ العمل في فريق وقيادة فرق العمل
2.4.7. Operate scientific meetings and proper time utilization.	٧-٤-٢ ادارة اللقاءات العلمية والقدرة على ادارة الوقت

ملحق ٥ : مصفوفة مضاهاة المعايير الأكاديمية للبرنامج و أهداف و نواتج تعلم البرنامج

Academic standards	ILOs
Graduate specifications	Overall aims
<p><b>1.1.</b>Infer generalizations related to optimal use of drugs based on categorization evaluation and analysis of the information obtained from research work on drug kinetics and action .</p> <p><b>1.2.</b> Employ research results in resolving medical problems associated with drug use as regards drug efficacy , adverse effects and interaction with other drugs.</p> <p><b>1.4.</b> Process of pharmacological knowledge and integrate them with other relevant sciences to be applicable in other clinical sciences ( surgery , medicine , anesthesiology , gynecology , obstetrics, pediatrics ).</p> <p><b>1.7.</b>Master a wide range of research tools employed in pharmacology.</p>	1.1.
<p>1.5.Aware of hot point of research as regards drug therapy and main theories in pharmacology.</p> <p><b>1.6.</b> Assign possible technical problem that may be encountered during research and trying to resolve them.</p>	1.2.
<p><b>1.8.</b>Sincerely attempt to improve methods of practicing all aspects of pharmacology regarding teaching, research and providing consultations about drug therapy.</p> <p><b>1.9.</b>Being acquainted with the appropriate technical methods required to improve his professional practice in pharmacology</p>	1.3.

<p><b>1.10.</b> Effective communication and adequate leadership of team work in various situations during practicing pharmacology( teaching , research and consulting).</p> <p><b>1.11.</b> Make appropriate conclusions in pharmacological practice based on available data.</p> <p><b>1.12.</b>Effective employments of available resources (lab equipments , teaching facilities , personells) and trying to create new ones.</p>	<b>1.4.</b>
<p><b>1.13.</b>Understanding th role of good practice in pharmacology as regards wise prescription of drugs and awareness of side effects and environmental hazards associated with exposure to chemicals and drugs on development of community and environmental preservation</p>	<b>1.5.</b>
<p><b>1.14.</b>Practce pharmacology either as teacher , researcher or consultant with extreme degrees of credibility , transparency and commitment with ethics.</p> <p><b>1.15.</b>Pledge to self improve his practice in pharmacology and transfer his knowledge in pharmacology to others .</p>	<b>1.6.</b>
<b>Knowledge and understanding</b>	
<p>2.1.1.Clearly explain the fundamental aspects of mechanism of action of drugs in cellular , subcellular and molecular levels , Pharmacokinetic facts , adverse drug as well as related domains of other medical sciences namely physiology , pathology , microbiology , parasitological.</p>	<b>2.a.1., 2.a.2.</b>
<p>2.1.2.Understand the fundamentals required to perform adequate research in the field of pharmacology as regards methodology and ethics .</p>	<b>2.a.3.</b>
<p>2.1.3. Review the moral and ethical principles of drug experimentation in animals and humans.</p>	<b>2.a.4.,2.a.3.</b>
<p>2.1.4.Proper choice of research tools to obtain precise knowledge of about drugs.</p>	<b>2.a.5.</b>
<p>2.1.5.Estimate of the expected environmental hazards associated with handling of drugs For the purpose of research or therapy</p>	<b>2.a.6.</b>
<b>Intellectual skills</b>	
<p>2.2.1Infer generalizations related to optimal use of drugs based on categorization evaluation and analysis of the information obtained from research work on drug kinetics and action .</p>	<b>2.b.1.</b>
<p>2.2.2. Employ research results in resolving medical problems associated with drug use as regards drug efficacy , adverse effects and interaction with other drugs.</p>	<b>2.b.2.</b>
<p>2.2.3.Make a research plan to investigate the biological properties of particular substance and possible use in treatment of diseases.</p>	<b>2.b.3.</b>

2.2.4. Design a plan for scientific research papers based on sound research work related to main issues in pharmacology	<b>2.b.4.</b>
2.2.5 Predict and evaluate the hazards related to drug research as regards dealing with drugs and animals and patients	<b>2.b.5.</b>
2.2.6. Improve research tools used in experimenting drugs on animals and clinical human trials.	<b>2.b.6.</b>
2.2.7. Make decisions to solve drug related health problems.	<b>2.b.7.</b>
2.2.8. Create and invent new research methods in pharmacology.	<b>2.b.8.</b>
2.2.9. Defend his Interpretations on research results based on logic evidences and proofs.	<b>2.b.9.</b>
<b>Practical skills</b>	
2.3.1.Master basic and advanced skills in pharmacology.	<b>3.c.1.</b>
2.3.2.Write and evaluate scientific reports about the use and effect of drugs .	<b>3.c.2.</b>
2.3.3. Achieve maximal efficacy of available research techniques and equipments.	<b>3.c.3.</b>
2.3.4.Utilize technical facilities to achieve maximal precision and clear presentation of research experimental results.	<b>3.c.4.</b>
2.3.5. Improve practice in the field of pharmacology and improve the skills of other medical personellsas regards optimal drug in pharmacology and other related medical specialties.	<b>3.c.5.</b>
<b>General and transferrable skills</b>	
<b>2.4.1.</b> Efficiently communicate with target categories either students ,collegues , medical and paramedical personells , research authorities and common people.	<b>2.d.1.</b>
<b>2.4.2.</b> Utilize information technology in improving practice of pharmacology	<b>2.d.2.</b>
2.4.3. Transfer appropriate knowledge in the field of pharmacology to different categories of target personells and evaluate their performance.	<b>2.d.3.</b>
2.4.4.Construct a plan for self evaluation and continuous learning.	<b>2.d.4.</b>
2.4.5. Utilize available sources of knowledge in pharmacology and related sciences .	<b>2.d.5.</b>
2.4.6. Work in a team and lead a team .	<b>2.d.6.</b>
2.4.7.Operate scientific meetings and proper time utilization.	<b>2.d.7.</b>

ملحق (٦) مصفوفة المعارف والمهارات للبرنامج الدراسي

Knowledge and understanding						ILOs		Courses	
2.a.6	2.a.5	2.a.4	2.a.3	2.a.2	2.a.1	Codes			
*			*	*	*	Phar 701	Basic pharmacology		
*	*	*	*			Phar 701	Practical pharmacology I		
*			*	*	*	Phar702	Applied pharmacology II		
*	*	*	*			Phar 702	Practical pharmacology II		
*	*		*	*	*	Phar702	Activities		
*		*		*		Phar702	Thesis		

Intellectual skills									ILOs		Courses	
2.b.9	2.b.8	2.b.7	2.b.6	2.b.5	2.b.4	2.b.3	2.b.2	2.b.1	Codes			
							*	*	Phar 701	Basic pharmacology		
	*	*	*	*	*	*			Phar 701	Practical pharmacology I		
							*	*	Phar702	Applied pharmacology II		
	*	*	*	*	*	*			Phar 702	Practical pharmacology II		
					*	*	*	*	Phar702	Activities		
*	*	*	*	*	*	*	*	*	Phar702	Thesis		

Practical skills					ILOs		Courses	
2.c.5	2.c.4	2.c.3	2.c.2	2.c.1	Codes			
					Phar 701	Basic pharmacology		
*	*	*	*	*	Phar 701	Practical pharmacology I		
					Phar702	Applied pharmacology II		
*	*	*	*	*	Phar 702	Practical pharmacology II		
*					Phar702	Activities		
*	*	*	*	*	Phar702	Thesis		

General and transferrable skills							ILOs		Courses	
2.d.7	2.d.6	2.d.5	2.d.4	2.d.3	2.d.2	2.d.1	Codes			
*		*		*	*	*	Phar 701	Basic pharmacology		
*	*	*	*	*	*	*	Phar 701	Practical pharmacology I		
*		*		*	*	*	Phar702	Applied pharmacology II		
*	*	*	*	*	*	*	Phar 702	Practical pharmacology II		
*	*	*	*	*	*	*	Phar702	Activities		
*	*	*		*	*	*	Phar702	Thesis		