

**MASTER IN PHARMACEUTICAL SCIENCES  
(Thesis Track)**

Plan Number	1 \ 12	٠٧	2005	T
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**I. GENERAL RULES CONDITIONS:**

1. This plan conforms to the valid regulations of the programs of graduate studies.
2. Areas of specialty of admission in this program:
  - Holders of the Bachelor's degree in:
    - a- Pharmacy
    - b- Pharm.D.

**II. SPECIAL CONDITIONS:** None.

**III. THE STUDY PLAN : Studying ( 33) Credit Hours as follows:**

**1. Obligatory courses: (1٠) Credit Hours:**

Course No.	Course Title	Credit hrs.	Theory	Prac.	Pre-request
١٢.١٧٢٢	Pharmaceutical Organic Chemistry	٣	٣	-	-
1201728	Drug Analysis and Identification	3	٢	٣	-
١٢.٢٧٢١	Drug Formulation and Drug Delivery (1)	٣	٣	-	-
1202727	Physical Pharmacy	٣	٣	-	-
1203701	Biopharmaceutics and Pharmacokinetics	3	٣	-	-

**2. Elective Courses: Studying (٩) Credit hours from the following:**

Course No.	Course Title	Credit hrs.	Theory	Prac.	Pre-request
1201707	Natural Products Chemistry	3	٢	٣	-
1232704	Pharmaceutical Microbiology	٣	٣	-	-
1201705	Drug Design	3	٣	-	-
1201710	Medicinal Chemistry	٣	٣	-	-
1201723	Phytotherapy	3	٣	-	-
1232709	Pharmaceutical Biotechnology	3	٣	-	-
1232724	Cosmeticolog	3	٣	-	-
١٢.٢٧٢٦	Drug Formulation and Drug Delivery (2)	3	٣	-	-
1233707	Clinical Pharmacology and Therapeutics.	٣	٣	-	-
0341737	Biostatistics	3	3	-	-

**3. Thesis: 9 Credit hours (120279٩) .**

## Course Description

- 1201722** **Pharmaceutical Organic Chemistry :** **(3cr.)**  
This course includes the common organic reactions (classical and recent) including their generic names, mechanism, reagents, conditions, the required starting materials and their generated products. Advanced synthetic strategies and retro-synthetic analysis, synthesis of complex natural products with biologically interesting molecules such as antibiotics, anti - hypertensive agents, hormones anticoagulants and antiviral agents.
- 1201728** **Drug Analysis and Identification:** **(3cr.)**  
This course includes application of general principles of systematic methods for the identification of organic compounds and drugs ( single material or mixture ) whether they are solids or liquids; via detailed studies of physical properties; solubility classifications; characterization of functional groups, preparation of appropriate derivatives, and final confirmation by instrumental methods. This course includes a practical application in which student is asked to identify unknown single compound and mixtures by applying accredited systematic methods in the laboratory.
- 1202721** **Drug Formulation and Drug Delivery (1) :** **(3cr.)**  
This course includes advances in microencapsulation, cyclodextrin complexes, coating, sustained parenterals, oral drug limitations and their solutions, transdermal and microemulsions.
- 1202727** **Physical Pharmacy :** **(3cr.)**  
This course includes the physicochemical properties for drugs as molecules and in their preparations, that affect the stability and the bioavailability of drugs, which determine the approach to be taken in the preformulation and further development stages. The course includes surface and interface properties like surface and interfacial tension, electrical properties. The course also includes, among other related topics, surfactant systems, colloidal dispersions and phase equilibria.
- 1203701** **Biopharmaceutics and Pharmacokinetics :** **(3cr.)**  
This course includes advanced topics in pharmacokinetics; introduction to mathematical techniques required for the treatment of complex pharmacokinetic modeling. It also include some advanced techniques which provide the basis for in-vitro/ in-vivo correlation of biopharmaceutical data. Additionally, application of pharmacokinetic principles to clinical practice and its relevance to the safe and effective management are included. This course also includes statistical design and analysis of bioavailability and bioequivalence studies.

- 1201707 Natural products Chemistry: (3cr.)**  
This course include the principles of natural products chemistry and research methods and their application in pharmaceutical technology. However emphasis on the occurrence of various natural products with biological activity will be discussed: in plants and other natural sources. General methods of isolation and purification by modern methods of chromatography , confirmatory tests and structure elucidation by the aid of instrumental analysis are covered. This course also includes a practical part in which the student will face all the practical aspects deal with the different methods of extraction, purification and structure elucidation of compounds in their pure forms.
- 1232704 Pharmaceutical Microbiology : (3cr.)**  
The course includes studies on the microbiological quality assurance where the students will study how to handle pharmaceutical preparation samples and will be familiar with the conventional and rapid microbiological methods used for identification of bacteria and fungi. They will also study how to evaluate different sterilizing processes. During the course, students will be exposed to the effect of the material and design of the container and closures on the activity and stability of pharmaceutical preparation, with special emphasis on microbiological point of view. They will also be familiar with modern biotechnology in production of substances from microorganisms such as antibiotic and insulin. A section on the genetic and biochemical basics of resistance of microorganisms to biocides is included.
- 1201705 Drug Design : (3cr.)**  
This course includes illustration of drug design concepts through the exposure into the procedures followed in drug design including search of leads and molecular manipulation. In addition to structure and action of drugs along with the quantitative structure activity relationships. Knowledge accumulation will be substantiated by common examples in drug design led to the discovery of new drugs.
- 1201711 Medicinal Chemistry : (3cr.)**  
This course includes detailed studies of the chemistry, biochemistry, pharmacology and metabolism of clinically important natural and synthetic steroidal and non-steroidal hormones and autocoids with also function as peripheral neurohormones . Steroids, chemistry, biochemistry and pharmacology.
- 1201723 Phytotherapy : (3cr.)**  
This course insight into dosage forms of application and effect of the most important herbal remedies and fields of applications. It also includes medicinal plants, phytopharmaceuticals and their effects on CNS, Cardiovascular system, Respiratory system, Digestive system and Urinary tract. Quality control of herbal medicines and poisonous plants are included.



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3. This plan conforms to the valid regulations of the programs of graduate studies.
4. Areas of specialty of admission in this program:
  - Holders of the Bachelor's degree in:
    - a- Pharmacy
    - b- Pharm.D.

**II. SPECIAL CONDITIONS: None.**

**III. THE STUDY PLAN : Studying ( 33) Credit Hours as follows:**

**1. Obligatory courses: (٢١) Credit Hours:**

Course No.	Course Title	Credit hrs.	Theory	Prac.	Pre-request
١٢.١٧٢٢	Pharmaceutical Organic Chemistry	٣	٣	-	-
1201728	Drug Analysis and Identification	3	٢	٣	-
١٢.٢٧٢١	Drug Formulation and Drug Delivery (1)	٣	٣	-	-
1202727	Physical Pharmacy	٣	٣	-	-
1203701	Biopharmaceutics and Pharmacokinetics	3	٣	-	-
1201707	Natural Products Chemistry	3	٢	٣	-
1232704	Pharmaceutical Microbiology	٣	٣	-	-

**2. Elective Courses: Studying (١٢) Credit hours from the following:**

Course No.	Course Title	Credit hrs.	Theory	Prac.	Pre-request
1201705	Drug Design	3	٣	-	-
1201710	Medicinal Chemistry	٣	٣	-	-
1201723	Phytotherapy	3	٣	-	-
1232709	Pharmaceutical Biotechnology	3	٣	-	-
1232724	Cosmeticology	3	٣	-	-
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1233707	Clinical Pharmacology and Therapeutics.	٣	٣	-	-
0341737	Biostatistics	3	3	-	-

**3. A comprehensive exam (120279^).**

## Course Description

1201722

(3cr.)

### *Pharmaceutical Organic Chemistry :*

This course includes the common organic reactions (classical and recent) including their generic names, mechanism, reagents, conditions, the required starting materials and their generated products. Advanced synthetic strategies and retro-synthetic analysis, synthesis of complex natural products with biologically interesting molecules such as antibiotics, anti - hypertensive agents, hormones anticoagulants and antiviral agents.

1201728

### **Drug Analysis and Identification:**

(3cr.)

This course includes application of general principles of systematic methods for the identification of organic compounds and drugs ( single material or mixture ) whether they are solids or liquids; via detailed studies of physical properties; solubility classifications; characterization of functional groups, preparation of appropriate derivatives, and final confirmation by instrumental methods. This course includes a practical application in which student is asked to identify unknown single compound and mixtures by applying accredited systematic methods in the laboratory.

1202721

(3cr.)

### **Drug Formulation and Drug Delivery (1) :**

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1202727

### **Physical Pharmacy :**

(3cr.)

This course includes the physicochemical properties for drugs as molecules and in their preparations, that affect the stability and the bioavailability of drugs, which determine the approach to be taken in the preformulation and further development stages. The course includes surface and interface properties like surface and interfacial tension, electrical properties. The course also includes, among other related topics, surfactant systems, colloidal dispersions and phase equilibria.

1203701

### **Biopharmaceutics and Pharmacokinetics :**

(3cr.)

This course includes advanced topics in pharmacokinetics; introduction to mathematical techniques required for the treatment of complex pharmacokinetic modeling. It also include some advanced techniques which provide the basis for in-vitro/ in-vivo correlation of biopharmaceutical data. Additionally, application of pharmacokinetic principles to clinical practice and its relevance to the safe and effective management are included. This course also includes statistical design and analysis of bioavailability and bioequivalence studies.

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