



Course Curriculum for Master Degree in Pharmaceutical Technology

The Master Degree in Pharmaceutical Technology is awarded by the Faculty of Graduate studies at Jordan University of Science and Technology (JUST) upon the fulfillment of the following requirements:

1. Compliance with the JUST Master Degree regulations approved by the Dean Council (No. 492/2006), dated 8/8/2006.
2. Successful completion of (34) credit hours in one of the following tracks:

First: Thesis Track

1. Compulsory Requirements: (16) credit hours as follows

Course Code	Course Name	Credit Hours
MATH 703	Mathematics	2
CIS 700	Computer Science	1
MATH 730	Advanced Biostatistics	2
PHAR 701	Instrumental Analysis	2
PHAR 750	Drug Design	3
PHAR 751	Advanced Physical Pharmacy	3
PHAR 753	Research Methodology	2
PHAR 755	Seminar in Pharmaceutical Technology	1

2. Elective Requirements: (9) credit hours as follows*

Course Code	Course Name	Credit Hours
PHAR 747	Pharmaceutical Microbiology	3
PHAR 752	Pharmaceutical Dosage Form Technology	3
PHAR 754	Drug Delivery Systems	3
PHAR 756	Advanced Biopharmaceutics and Pharmacokinetics	3
PHAR 757	Advanced Pharmaceutical Operations	3
PHAR 758	Drug Stability	3
PHAR 759	Disperse Systems	3
PHAR 760	Mass Transfer	3
PHAR 761	Sterile Pharmaceutical Dosage Forms	3

* The student may study not more than 3 credit hours from courses of (700 or 800) level offered by other programs related to his field of study upon approval of the Dean based on the departmental committee recommendation and the approval of the faculty committee of graduate studies.

3. Master thesis (PHAR 799): Total of (9) credit hours as follows

Course Code	Course Name	Credit Hours
PHAR 799A	Master Thesis	9
PHAR799B	Master Thesis	6
PHAR 799C	Master Thesis	3
PHAR 799D	Master Thesis	0

Second: Non-Thesis Track

1. Compulsory Requirements: (22) credit hours as follows

Course Code	Course Name	Credit Hours
MATH 703	Mathematics	2
CIS 700	Computer Science	1
MATH 730	Advanced Biostatistics	2
PHAR 701	Instrumental Analysis	2
PHAR 750	Drug Design	3
PHAR 751	Advanced Physical Pharmacy	3
PHAR 753	Research Methodology	2
PHAR 755	Seminar in Pharmaceutical Technology	1
PHAR 756	Advanced Biopharmaceutics and Pharmacokinetics	3
PHAR 758	Drug Stability	3

2. Elective Requirements: (12) credit hours as follows*

Course Code	Course Name	Credit Hours
PHAR 747	Pharmaceutical Microbiology	3
PHAR 752	Pharmaceutical Dosage Form Technology	3
PHAR 754	Drug Delivery Systems	3
PHAR 757	Advanced Pharmaceutical Operations	3
PHAR 759	Disperse Systems	3
PHAR 760	Mass Transfer	3
PHAR 761	Sterile Pharmaceutical Dosage Forms	3

* The student may study not more than 3 credit hours from courses of (700 or 800) level offered by other programs related to his field of study upon approval of the Dean based on the departmental committee recommendation and the approval of the faculty committee of graduate studies.

3. Passing the Comprehensive Exam (PHAR 798): Zero Credit Hour.

Course Descriptions

PHAR 701 Instrumental Analysis: (2 Credit Hours)

This course covers the advanced spectrophotometric methods of analysis including UV-Visible, IR, MS, NMR in addition to phosphorescence spectrometry, flame emission and atomic absorption spectroscopy. Chromatographic methods are also discussed with special emphasis on the coupled techniques of GC/MS and LC/MS.

PHAR 747 Pharmaceutical Microbiology: (3 Credit Hours)

The course covers modes of action, resistant development and microbiological assays of antimicrobial agents in clinical use. Preservation of pharmaceuticals, sterilization, antibiotics and biotechnology (Industrial microbiology, using microorganisms for production of chemicals and pharmaceuticals) will be presented.

PHAR 750 Drug Design: (3 Credit Hours)

This course includes discussion and presentation of the basic principles of designing a dosage form from the pharmaceutical point of view starting with prodrugs and modification of conventional drugs. The course also includes a presentation of the modes of degradation of drugs and enhancing their stability within the dosage form.

PHAR 751 Advanced Physical Pharmacy: (3 Credit Hours)

This course attempts to integrate the factual knowledge of pharmacy through the development of broad principles of its own, and it aids the students in predicting solubility, compatibility and biologic action of drug products. This course includes solubility, diffusion, dissolution, adsorption and micellization.

PHAR 752 Pharmaceutical Dosage Form Technology: (3 Credit Hours)

This course covers the fundamental concepts of dosage forms, updating theories and technology used to formulate and evaluate dosage forms, the impact of different parameters on the manufacturing and bioavailability of finished products. Control of cross contamination during the processing of dosage forms, industrial scale production and problems associated with its production, and advanced techniques adopted in the evaluation of pharmaceutical dosage forms will be covered.

PHAR 753 Research Methodology: (2 Credit Hours)

Practical application of different aspects and special problems encountered in research.

PHAR 754 Drug Delivery Systems: (3 Credit Hours)

This course is designed to cover the theoretical aspects related to controlled drug delivery systems. This includes drug properties affecting system design, methodologies utilized in various drug delivery systems, dosage forms with prolonged and sustained action. Physical, chemical and pharmacokinetic considerations encountered in the design of drug delivery systems will also be discussed.

PHAR 755 Seminar in Pharmaceutical Technology: (1 Credit Hour)

This course covers selected topics in pharmaceutical technology presented by students as seminars.

PHAR 756 Advanced Biopharmaceutics and Pharmacokinetics: (3 Credit Hours)

This course includes a study of the physicochemical, physiological, pathological and pharmaceutical factors affecting the absorption, distribution and elimination of drugs from the body. A review of basic pharmacokinetic principles and elaboration on model assignment and nonlinear pharmacokinetics of drugs will be presented. The course will also include detailed discussion of interpretation of plasma drug concentrations, protein binding and its effect on the disposition of drugs, and principles of therapeutic drug monitoring

PHAR 757 Advanced Pharmaceutical Operations: (3 Credit Hours)

This course deals with different pharmaceutical unit operations utilized in pharmaceutical and chemical industries, such as drying, mixing, milling, filtration... etc. More emphasis is placed upon manipulation of techniques carried out by the pharmaceutical industry.

PHAR 758 Drug Stability: (3 Credit Hours)

A comprehensive course, which encompasses the study of parameters affecting stability, efficiency and safety of dosage forms. These parameters include drug polymorphs, pH and pH rate profile, prodrugs, drug analogs and additive interactions.

PHAR 759 Disperse Systems: (3 Credit Hours)

A study of disperse systems including small particle technology, interfacial phenomena, electrokinetics and rheological properties of materials in colloidal and coarse dispersions.

PHAR 760 Mass Transfer: (3 Credit Hours)

Advanced topics in mass transfer and absorption of drugs through membranes.

PHAR 761 Sterile Pharmaceutical Dosage Forms: (3 Credit Hours)

A comprehensive study of the design and manufacture of safe, effective, and reliable pharmaceutical dosage forms with special emphasis given to parenteral products.

PHAR 798 Passing the Comprehensive Exam: (Zero Credit Hour)

In this course the student will set for an exam that includes all topics addressed throughout his academic program either from inside faculty of pharmacy or outside faculty of pharmacy. Comprehensive exam will be held inside school of pharmacy under the supervision of specialized faculty members.

PHAR 799 Master Thesis: (9 Credit Hours)

Individual research under the direction of a faculty member (s) and committee leading to preparation, completion, and oral defense of a thesis.