



Jordan University of Science and Technology
Faculty of Graduate Studies



The Study Plan for the Master Degree in Clinical Pharmacy

The Master Degree in Clinical Pharmacy 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.
2. Successful completion of (34) credit hours in the following tracks:

First: Thesis Track

A. Department compulsory requirements: 19 credit hours

Course Symbol and Number	Course Name	Credit Hours
Phar. 700	Scientific Writing and Research Ethics	2
Phar. 702	Applied Statistics	2
Phar. 703	Therapeutics 1	3
Phar. 704	Therapeutics 2	3
Phar. 705	Design of Clinical Studies	1
Phar. 706	Foundations of Clinical Pharmacy	2
Phar. 707	Clinical Training: Internal Medicine	1.5
Phar. 708	Clinical Training: Cardiology	1.5
Phar. 710	Clinical Training: Ambulatory Care	1.5
Phar. 711	Clinical Training: Critical Care	1.5
Phar. 770	Seminar	0

B. Department elective requirements: 6 credit hours

Group 1: The student should complete 3 credits from the following:

Course Symbol and Number	Course Name	Credit Hours
Phar. 712A	Clinical Training: Oncology	1.5
Phar. 712B	Clinical Training: Pediatrics	1.5
Phar. 712C	Clinical Training: Pediatric Oncology	1.5
Phar. 712D	Clinical Training: Hospital Pharmacy	1.5

Group 2: The student should complete 3 credits from the following:

Course Symbol and Number	Course Name	Credit Hours
Phar. 714	Selected Topics in Clinical Pharmacy	3
Phar. 715	Parenteral Nutrition	2
Phar. 716	Case Studies in Clinical Biochemistry	2
Phar. 717	Biomarkers in Clinical Research	2
Phar. 718	Hospital Pharmacy and Communication Skills	3
Phar. 719	Drug Information	1
Phar. 728	Advanced Pharmacokinetics/ Pharmacodynamics	3
Phar. 729	Pharmacogenetics in Health and Disease	3
Phar. 740	Pharmaceutical Care	3
Phar. 741	Pharmacoeconomics	3
Phar. 742	Theoretical Development of Survey Measures	3
Phar. 779A	Special Topics (A)	3
Phar. 779B	Special Topics (B)	2
Phar. 779C	Special Topics (C)	1

C. Specialization compulsory requirements: total of 9 credit hours

Course Symbol and Number	Course Name	Credit Hours
Phar. 799A	Master Thesis	9
Phar. 799B	Master Thesis	6
Phar. 799C	Master Thesis	3
Phar. 799D	Master Thesis	0

Guidance Plan for Clinical Pharmacy/ Thesis Track

First Year:

First Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 700	Scientific Writing and Research Ethics	2
Phar. 702	Applied Statistics	2
Phar. 703	Therapeutics 1	3
Phar. 705	Design of Clinical Studies	1

Second Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 704	Therapeutics 2	3
Phar. 706	Foundations of Clinical Pharmacy	2
	Department Elective Requirement	3

Summer Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 707	Clinical Training: Internal Medicine*	1.5
Phar. 708	Clinical Training: Cardiology*	1.5

*Student cannot register for this course unless he/she has successfully completed 16 credit hours

Second Year:

First Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 710	Clinical Training: Ambulatory Care*	1.5
Phar. 711	Clinical Training: Critical Care*	1.5
	Department Elective Requirement (Clinical Training)*	1.5
	Department Elective Requirement (Clinical Training)*	1.5
Phar. 770	Seminar	0

*Student cannot register for this course unless he/she has successfully completed 16 credit hours

Second Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 799A	Master Thesis	9

Second: Comprehensive Exam Track

A. Department compulsory requirements: 25 credit hours

Course Symbol and Number	Course Name	Credit Hours
Phar. 700	Scientific Writing and Research Ethics	2
Phar. 702	Applied Statistics	2
Phar. 703	Therapeutics 1	3
Phar. 704	Therapeutics 2	3
Phar. 705	Design of Clinical Studies	1
Phar. 706	Foundations of Clinical Pharmacy	2
Phar. 707	Clinical Training: Internal Medicine	1.5
Phar. 708	Clinical Training: Cardiology	1.5
Phar. 710	Clinical Training: Ambulatory Care	1.5
Phar. 711	Clinical Training: Critical Care	1.5
Phar. 712A	Clinical Training: Oncology	1.5
Phar. 712B	Clinical Training: Pediatrics	1.5
Phar. 712D	Clinical Training: Hospital Pharmacy	1.5
Phar. 712E	Clinical Training: Surgery	1.5
Phar. 770	Seminar	0

B. Department elective requirements: 9 credit hours

Group 1: The student should complete 3 credits from the following:

Course Symbol and Number	Course Name	Credit Hours
Phar. 712C	Clinical Training: Pediatric Oncology	1.5
Phar. 713A	Clinical Training: Neuropsychiatry	1.5
Phar. 713B	Clinical Training: Neonatal Intensive Care	1.5
Phar. 713C	Clinical Training: Gynaecologic and Obstetrics	1.5
Phar. 713D	Clinical Training: Family Medicine	1.5
Phar. 713E	Clinical Training: Nutritional Support	1.5

Group 2: The student should complete 6 credits from the following:

Course Symbol and Number	Course Name	Credit Hours
Phar. 714	Selected Topics in Clinical Pharmacy	3
Phar. 715	Parenteral Nutrition	2
Phar. 716	Case Studies in Clinical Biochemistry	2
Phar. 717	Biomarkers in Clinical Research	2
Phar. 718	Hospital Pharmacy and Communication Skills	3
Phar. 719	Drug Information	1
Phar. 728	Advanced Pharmacokinetics/ Pharmacodynamics	3
Phar. 729	Pharmacogenetics in Health and Disease	3
Phar. 740	Pharmaceutical Care	3
Phar. 741	Pharmacoeconomics	3
Phar. 742	Theoretical Development of Survey Measures	3
Phar. 779A	Special Topics (A)	3
Phar. 779B	Special Topics (B)	2
Phar. 779C	Special Topics (C)	1

C. Faculty compulsory requirements: zero credit hour

Course Symbol and Number	Course Name	Credit Hours
Phar. 798	Comprehensive Exam	0

Guidance Plan for Clinical Pharmacy/ Comprehensive Exam Track

First Year:

First Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 700	Scientific Writing and Research Ethics	2
Phar. 702	Applied Statistics	2
Phar. 703	Therapeutics 1	3
Phar. 705	Design of Clinical Studies	1

Second Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 704	Therapeutics 2	3
Phar. 706	Foundations of Clinical Pharmacy	2
	Department Elective Requirement	3
	Department Elective Requirement	3

Summer Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 707	Clinical Training: Internal Medicine*	1.5
Phar. 708	Clinical Training: Cardiology*	1.5

*Student cannot register for this course unless he/she has successfully completed 19 credit hours

Second Year:

First Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 710	Clinical Training: Ambulatory Care*	1.5
Phar. 711	Clinical Training: Critical Care*	1.5
Phar. 712A	Clinical Training: Oncology*	1.5
	Department Elective Requirement (Clinical Training)*	1.5
Phar. 770	Seminar	0

*Student cannot register for this course unless he/she has successfully completed 19 credit hours.

Second Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 712B	Clinical Training: Pediatrics*	1.5
Phar. 712D	Clinical Training: Hospital Pharmacy*	1.5
Phar. 712E	Clinical Training: Surgery*	1.5
	Department Elective Requirement (Clinical Training)*	1.5

*Student cannot register for this course unless he/she has successfully completed 19 credit hours.

Summer Semester:

Course Symbol and Number	Course Name	Credit Hours
Phar. 798	Comprehensive Exam	0

Course Description
Master degree in Clinical Pharmacy

Phar. 700: Scientific Writing and Research Ethics (2 credit hours)

This course covers the topics relevant to research methods, including, literature search, principles of scientific writing, research proposal, thesis preparation, and manuscript writing. It focuses on aspects in research ethics, research misconduct, data management and presentation, human participants and animal subjects in research, and laboratory safety. This will be covered by writing a research proposal of a selected subject of the student's interest.

Phar. 702: Applied Statistics (2 credit hours)

This course will cover descriptive statistics and statistical inference relevant to health care research, including basic principles in data analysis, correlation analysis, analysis of variance, linear regression and logistic regression. Students will also learn how to conduct data analysis using statistical softwares.

Phar. 703: Therapeutics 1: (3 credit hours)

This course covers the pharmacotherapy for respiratory, oncologic, gastrointestinal, renal, urological, and infectious diseases in relation to the pathophysiologic conditions of the patient. The course discusses concepts of drug action, therapeutic uses, goals of treatment, pharmaceutical care plan, patient counselling, drug monitoring, and evaluation of the therapeutic outcomes. Students learn methods of interacting and supporting other members of the medical care team by developing and evaluating patient's therapeutic plans and offering alternative therapeutic options/plans when needed. The course will provide students with the knowledge necessary for the practice of patient oriented pharmacy.

Phar. 704: Therapeutics 2: (3 credit hours)

This course covers the pharmacotherapy cardiovascular, neurological, psychiatric, endocrine, hematological and immunological diseases in relation to the pathophysiologic conditions of the patient. The course discusses concepts of drug action, therapeutic uses, goals of treatment, pharmaceutical care plan, patient counselling, drug monitoring, and evaluation of the therapeutic outcomes. Students learn methods of interacting and supporting other members of the medical care team by developing and evaluating patient's therapeutic plans and offering alternative therapeutic options/plans when needed. The course will provide students with the knowledge necessary for the practice of patient oriented pharmacy.

Phar. 705: Design of Clinical Studies (1 credit hour)

The course deals with various designs of clinical research such as observational studies and clinical trials in the context of epidemiological concepts, and with considerations of medical, ethical and therapeutic requirements.

Phar. 706: Foundations of Clinical Pharmacy (2 credit hours)

This course is designed to provide the student with fundamental foundational understandings of the principles of clinical pharmacy and pharmacy practice. The course will focus on the provision of knowledge about critical components of clinical pharmacy to ensure the delivery of safe,

effective, and competent patient care and professional practice. Topics about pharmaceutical and health outcomes such as medication adherence and quality of life will be also discussed.

Phar. 707: Clinical Training: Internal Medicine (1.5 credit hours)

Four experiential training weeks in the internal medicine department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 708: Clinical Training: Cardiology (1.5 credit hours)

Four experiential training weeks in the cardiology department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 710: Clinical Training: Ambulatory Care (1.5 credit hours)

Four experiential training weeks in outpatient clinics department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 711: Clinical Training: Critical Care (1.5 credit hours)

Four experiential training weeks in the critical care department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 712A: Clinical Training: Oncology (1.5 credit hours)

Four experiential training weeks in the oncology department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 712B: Clinical Training: Pediatrics (1.5 credit hours)

Four experiential training weeks in the pediatrics department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients'/parents education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 712C: Clinical Training: Pediatric Oncology (1.5 credit hours)

Four experiential training weeks in the pediatrics' oncology department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients'/parents education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 712D: Clinical Training: Hospital Pharmacy (1.5 credit hours)

Four weeks in the hospital pharmacy departments, which covers inpatient and outpatient pharmacies, inventory, purchase and storage. This course provides the means by which students will extend their clinical knowledge and skills to practice as hospital pharmacists.

Phar. 712E: Clinical Training: Surgery (1.5 credit hours)

Four experiential training weeks in the surgery department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 713A: Clinical Training: Neuropsychiatry (1.5 credit hours)

Four experiential training weeks in the neurology and psychiatric departments. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 713B: Clinical Training: Neonatal Intensive Care (1.5 credit hours)

Four experiential training weeks in the neonatal intensive care unit department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, parents' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 713C: Clinical Training: Gynaecologic and Obstetrics (1.5 credit hours)

Four experiential training weeks in the gynaecology and obstetrics department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 713D: Clinical Training: Family Medicine (1.5 credit hours)

Four experiential training weeks in the family medicine department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Phar. 713E: Clinical Training: Nutritional Support (1.5 credit hours)

Four experiential training weeks in the area of clinical nutrition. This includes hands-on experience and various activities such as attending grand rounds, presenting patients' medical problems, detailed evaluation of drug therapy, patients' education, and interprofessional interaction. Students will learn how to assess nutritional status of hospitalized patients to efficiently calculate and prepare enteral and parenteral formulas. This course provides the means by which students will extend their clinical knowledge and professional skills to practice as clinical pharmacists.

Phar. 714: Selected Topics in Clinical Pharmacy (3 credit hours)

This course will cover recent and emergent topics related to clinical pharmacy.

Phar. 715: Parenteral Nutrition (2 credit hours)

This course is designed to explore the wide scope of human parenteral nutrition. This course covers types of malnutrition, components of nutritional screening and assessment, complications and indications of parenteral nutrition therapy, nutrient-drug interactions, and monitoring parameters and nutritional requirements in nutritional support of most of the common diseases and specific states.

Phar. 716: Case Studies in Clinical Biochemistry (2 credit hours)

The course is designed as a case-oriented approach to study the biochemical changes of human diseases. The course will emphasize on biochemical investigation and laboratory findings of each disease through presenting selected cases that cover most of the common diseases.

Phar. 717: Biomarkers in Clinical Research (2 credit hours)

This course will cover biomarkers and their applications in clinical research. It will emphasize on quantitative and qualitative tests used to assess biomarkers. In addition, it focusses on the analysis and interpretation of biomarkers data in relation to drug efficacy and safety as well as clinical outcomes.

Phar. 718: Hospital Pharmacy and Communication Skills (3 credit hours)

This course covers a detailed discussion of the practice of Hospital Pharmacy including the different duties of the hospital pharmacists, namely: organization of the hospital and hospital pharmacy, purchase and inventory control, the Pharmacy and Therapeutics Committee, the Hospital Formulary, unit dose system, preparation of intravenous admixture services, patient education and counseling. Communication skills with medical staff and patients will also be covered.

Phar. 719: Drug Information (1 credit hour)

The course deals with different drug information resources. A systematic approach to the search for drug information will be emphasized. The course provides the opportunity for students to take part in the process of appropriately responding to healthcare providers' and patients' drug-information requests.

Phar. 728: Advanced Pharmacokinetics/Pharmacodynamics (3 credit hours)

This course provides an overview of the different aspects of pharmacokinetics and pharmacodynamics of drugs. Those include different features of drug absorption, distribution, metabolism and excretion in addition to drug target (receptor, enzyme, transporter, etc) interactions. The course also emphasizes on analysis and interpretation of kinetics data, and the clinical application of theories describing drug kinetics.

Phar. 729: Pharmacogenetics in Health and Disease (3 credit hours)

This course will study human genetics variations and their effect on health and disease. The course will provide knowledge necessary to understand pharmacogenomics including research design and methods/ techniques used in genetics research. The course will emphasize the concepts of personalized medicine.

Phar. 740: Pharmaceutical Care (3 credit hours)

This course focuses on teaching the students how to provide comprehensive pharmaceutical care for the patients in order to achieve the optimum goal and improving the quality of life. Through this course the student will enhance his/her skills in assessing drug therapy, developing and monitoring pharmacy care plans, and communicating recommendations to the other health care providers.

Phar. 741: Pharmacoeconomics (3 credit hours)

This course introduces the central role of pharmacoeconomics (PE) in healthcare decision making from different perspectives. The course explains fundamental methods of PE analysis and illustrates a step-by-step rational approach to select the appropriate analysis method. This course helps students identify, quantify and compare different outcomes (Economic, Clinical, and Humanistic) of pharmaceutical products and services to broaden their skills in comparing treatments, implementing individualized therapeutic plans, and conducting critical appraisal of PE studies.

Phar. 742: Theoretical Development of Survey Measures (3 credit hours)

This course introduces methods of research that help students to obtain knowledge that links between theory and practice in research. This course can assist students to understand survey research terminology, identify the structure of theoretical frameworks, analyze published survey measures, and select the appropriate match between theories and survey measures. This course equips students with necessary skills to design formats and questions to collect data about variables of interest. In addition, it will prepare students to evaluate psychometric properties of survey measures.

Phar. 770: Seminar (0 credit hours)

This course is designed so students present their research ideas/findings as seminars.

Phar. 779A: Special Topics (A) (3 credit hours)

This course covers special topics in the field of pharmacy.

Phar. 779B: Special Topics (B) (2 credit hours)

This course covers special topics in the field of pharmacy.

Phar. 779C: Special Topics (C) (1 credit hour)

This course covers special topics in the field of pharmacy.

Phar. 798: Comprehensive Exam (0 credit hours)

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

Phar. 799 (A, B, C, D): Master Thesis (0, 3, 6, 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.