

School	School of Pharmacy		
Major	Pharmacy		
Major Requirements			
Code	Title	Credits	Description
PHAR665	Pharmacy Practice Experience IV(PPE IV)	6	This portion of the Law and Ethics in Pharmacy Practice focuses on pharmacy law. The course will cover the Lebanese pharmacy rules and regulations that impact and regulate the practice of pharmacy. Topics including the regulation of medications, regulation of controlled substances, and the rules concerning pharmacy practice on the Lebanese territories will be extensively covered.
PHAR660	Pharmacy Practice Experience III (PPE III)	6	This portion of the Law and Ethics in Pharmacy Practice focuses on pharmacy law. The course will cover the Lebanese pharmacy rules and regulations that impact and regulate the practice of pharmacy. Topics including the regulation of medications, regulation of controlled substances, and the rules concerning pharmacy practice on the Lebanese territories will be extensively covered.
PHAR656	Pharmacy Law	1	This portion of the Law and Ethics in Pharmacy Practice focuses on pharmacy law. The course will cover the Lebanese pharmacy rules and regulations that impact and regulate the practice of pharmacy. Topics including the regulation of medications, regulation of controlled substances, and the rules concerning pharmacy practice on the Lebanese territories will be extensively covered.
PHAR650	Pharmacy Dispensing Practice	2	This course focuses on the clinical aspect of pharmacy as well as its practices. Each student will be working individually from his pharmacy station in the dispensing lab. Some students will be placed in pharmacy settings created at the University while others will play the role of patients. Dispensing practices, counseling and checking for drug interactions and other pharmacy practices will be applied in this course so that the student will be evaluated for clinical and practical skills upon graduation. A counseling session will take place at the end of each laboratory session.
PHAR625	Pharmacoeconomics	3	This course introduces basic concepts in accounting useful to pharmacy practice as well as basic micro and macro economical theories. Topics will focus on supply and demand analysis, inflation, balance sheets, income statement and other concepts necessary to achieve optimal financial management and meet national drug policies. This course teaches the students to evaluate health economic and clinical outcome researches and to apply pharmacoeconomic analysis in clinical practice.

PHAR620	Pharmacotherapeutics VI (Hematology/Oncology)	3	The objectives of the oncology course are to provide information about the pathophysiology of common Hematology/oncology disorders and to present standard therapies for treating these disorders. Emphasis will be placed on : 1. Designing appropriate regimens 2. Defining therapeutic goals 3. Monitoring clinical and laboratory parameters 4. Identifying drug interactions and adverse reactions a. The pharmacist helps to manage patients who experience the many complications related to the disease (e.g., pain management, hypercalcemia) and adverse effects associated with treatment b. Hence, the student is expected to devote considerable time, learning about the medication management of these unwanted side effects (e.g., febrile neutropenia, nausea/vomiting, etc.) in the oncologic setting c. Students will approach updated guidelines for solid tumor treatment as well as liquid tumor guidelines d. Role of pharmacist to maximize patient care & minimize adverse reactions
PHAR615	Pharmacotherapeutics V (infectious Diseases)	3	Pharmacotherapeutics V (infectious Diseases)
PHAR610	Toxicology	3	A presentation of the fundamentals of clinical toxicology and poison prevention. This course discusses the management of acute poisoning and drug over dose through case studies. Use of literature resources pertinent to the treatment and management of poisoning is presented.
PHAR635	Parenteral Dosage Forms	2	In this course, the student will be exposed to the parenteral drug administration particularly drug reconstitution, chemotherapy handling, TPN formulations, enteral feeding and fluid replacements. Patient nutritional status and fluid requirements will be assessed. This is an interactive practical module that will enhance students' understanding of therapeutics. Some principles already seen during university studies will be emphasized upon and students will practice drug admixture when appropriate.
PHAR606	Non-Prescription Drugs	3	The purpose of this course is to teach the students a consistent and systematic approach used to meet the drug-related needs for patients with self-care concern and to promote the value of their guidance in selecting and monitoring treatment with nonprescription drug. This course focuses on increasing a patient awareness of the importance of consulting a pharmacist, not only when considering a drug for the first time but also when making subsequent purchases. Emphasis is placed on product selection, herbal medicines, vitamins, dietary supplements and appropriate patient consultation for each. Medical supplies and equipments pertaining to pharmacy practice are also discussed.
PHAR580	Pharmacy Practice Experience II (PPE II)	6	This course is part of a series of practice experience courses which introduces students to the philosophy and practice of pharmaceutical care, including patient counseling, monitoring plans, and patient outcomes, with emphasis on the role of the pharmacist as the primary manager of patient drug therapies. Students are also required to spend one month training in the Drug Information Center to practice their role as drug information provider for the public and other healthcare professionals.

PHAR585	Pharmacy Seminar	2	This course involves meticulous selection of up-dated research and review articles that are pertinent to pharmacotherapeutics course topics that students are concurrently taking. Students are responsible for evaluating and critiquing original publications and review articles focusing on the weaknesses and strengths of the article and appropriately extrapolating the results to the proper patient population by evaluating the internal and the external validity of the article reviewed.
PHAR570	Pharmacotherapeutics IV (Endocrinology/Dermatology)	3	Pharmacotherapeutics IV (Endocrinology/Dermatology)
PHAR565	Pharmacotherapeutics III (Cardiology/Nephrology)	3	Pharmacotherapeutics III (Cardiology/Nephrology)
PHAR560	Pharmacogenomics	3	This course is designed to understand the genetic factors underlying efficacy/toxicity of drug therapy, to assess the value of phenotyping / genotyping in guiding drug therapy of individual patients, and to evaluate genomic methods in drug design, development and therapy. The course is intended to prepare pharmacists to integrate pharmacogenomic principles into practice. The course teaches the basics of genetics and pharmacogenomics, and discusses applications in specific therapeutic areas.
PHAR555	Pharmacology II	4	Pharmacology is a broad field science that deals with physiology, anatomy, medicinal chemistry, therapeutics, math, and physics. The 3 courses encompass pharmacodynamics, pharmacotherapeutics, pharmacokinetics, pharmacognosy, and toxicology of drugs and drug classes. PHAR 5311 and PHAR 5321 allow students to recognize medication classes and understand physico-chemical properties of drugs, and the relationship between these principles and the biological mechanisms of drug action. An understanding of these pharmacological and chemical principles serves as a basis for understanding the pharmaceutical, pharmacokinetic and pharmaco-dynamic interactions of available drugs as well as future drug products.
PHAR520	Pharmacotherapeutics II (Pulmonary/Rheumatology)	3	Pharmacotherapeutics II (Pulmonary/Rheumatology)
PHAR515	PharmacotherapeuticsI (Neurology/Psychiatry)	3	PharmacotherapeuticsI (Neurology/Psychiatry)
PHAR510	Biopharmaceutics& Pharmacokinetics	4	Biopharmaceutics& Pharmacokinetics
PHAR505	Pharmacology I	4	The course provides an overview on the assessment of the nutritional needs of healthy individuals and patients with different medical conditions. It emphasizes the role of vitamins, minerals, and trace elements in maintaining health and treating illnesses. The course allows the student to suggest a dietary plan with the proper composition and amounts of nutrients taking into consideration the hydration status, kidney function, body weight, and other medical conditions that influence selection.

PHAR480	Pharmacy Practice Experience I (PPEI)	6	This experiential education program is 12 weeks in duration in a community pharmacy setting and is designed for the pharmacy student to actively participate in a supervised program of pharmacy practice. Students gain experience by applying their didactic learning in the pharmaceutical sciences in resolving problems that arise during the delivering pharmaceutical services for outpatients. This practice experience emphasizes on the managerial tasks of the pharmacist ranging from medication selection and order, proper handling and dispensing of controlled substances, appropriate filling and maintaining patient profiles, and patient counseling.
PHAR465	Interpretations of Lab Data	3	Laboratory data play a vital role in the diagnosis and treatment of patients. Results from laboratory tests may confirm or rule out a presumptive diagnosis of disease states such as anemia, dyslipidemia, diabetes, or other chronic illness. Yet laboratory data are one of the least understood clinical sciences among the public. This course is a comprehensive resource for pharmacy students by providing information on common laboratory tests used to screen for or diagnose disease, monitor the effectiveness and safety of treatment, or assess disease severity. Each laboratory test is described in terms of its clinical uses, how the lab test relates to the pathophysiology of the disease, how to interpret the lab test results, and causes for abnormal lab test results. This course familiarizes pharmacy students with the fundamentals of interpreting clinical laboratory test results, which is very important for the diagnosis of disease, and/or for selection and monitoring of therapy. The course is focused on providing information that is clear, relevant, convenient, and practical. Chapters will be organized primarily by organ system, and handouts will be provided to illustrate how the results of a particular laboratory test should be interpreted.
PHAR460	Pharmacy Management & Drug Marketing	3	As Pharmacy practice evolved from a product to patient orientation service, pharmacists are facing unique challenges to fulfill their professional roles and provide superior patient care and clinical services which can be made possible by pharmacists skilled in management. The aim of the course is to teach pharmacy students that superior patient care and good pharmacy business are not mutually exclusive and to familiarize the student with the management functions and resources common to all pharmacy practice settings including managing people, money, operations, traditional goods and services as well as managing risks and value-added services.
PHAR455	Physical Assessment in Pharmacy Practice	3	This course introduces the student to the physical examination process. The student will assist in assessing vital signs and other common physical exams done in inpatient and outpatient settings in order to maximize patients' medical therapies. The course will include laboratory session where students practice use of basic medical devices and vital signs measurement assessment.

PHAR450	Medicinal Chemistry II	3	A continuation of PHAR 4210 in which discussion of central nervous system agents is concluded. Other topics include cardiovascular agents, diuretics, antineoplastics, environmental toxicants, antiparasitics, the hormones, and others. The course emphasizes on structure-activity relationship (SAR) and the physiochemical properties which determine the dosage regimen and pharmacokinetic parameters of these drugs.
PHAR425	Pharmacognosy & Herbal Medicine	3	Pharmacognosy is an applied science that deals with the chemical, biological, biochemical and biotechnological features of natural drugs and their constituents. Plants are essential constituents of drugs, and yet the ways in which we are managing some of them is seriously harming people and environments worldwide. Focusing on correct use of natural medicinal compounds, methods of extraction and identification is of great value. Besides, information about structure-activity relationship and theories involved in identification of natural products are tackled.
PHAR420	Physical Pharmacy	3	This course helps in understanding the fundamental physicochemical principles relating to the design of pharmaceutical dosage forms by focusing on solubility, dissolution, distribution, diffusion principles, liquids, colloids, and thermodynamics.
PHAR415	Professional Communications	1	This course will help the students to be more effective patient educators. Its goal is to improve their interpersonal communication with patients, doctors and other healthcare providers. Pharmacists' responsibility today is not only limited to dispensing appropriate medications but also ensure patient understanding of what they are used for. By becoming active in patient counseling, pharmacists can offer help for patients and maintain a good standard of their profession. Counseling, proper communication and a clinical approach towards pharmacy care should be the basis of competition between pharmacists rather than products prices and discounts.
PHAR410	Drug Dosage Forms I	3	Drug Dosage Form (I) is the first part of a two series of pharmaceuticals course that deals with different formulations and drug delivery systems focusing on the rational and the significance of each dosage form. The part of dosage forms covered in this course pertains to solid and semisolid preparations, describing their types, composition, methods of preparation, packaging, storage and quality control.

PHAR407	Pharmaceutical Analysis & Biotechnology	2	Pharmaceutical analysis is a branch of chemistry, which involves the series of processes for identification, determination, quantitation and purification of compounds. This field employs modern instrumentation in bio- and product analysis. Instruments are used to measure physical properties not typically examined with classical analytical techniques to distinguish the constituents and the concentrations of constituents in a given sample. The growth of instrumental analysis will continue as new methods and new instruments are developed. This course introduces students to concepts of various modern instrumental analytical techniques used in pharmaceutical research and industry. Basic principles, components, and operation of each technique are presented in lectures and laboratory sessions. The course covers the basic principles of each method, mathematical treatment, laws, calculation, advantages and limitations and finally, the applications. Focus is done on application in the field of pharmaceutical analysis.
PHAR400	Medicinal Chemistry I	3	Medicinal Chemistry I
PHAR300	Pharmaceutical Calculations	2	This course provides the pharmacy student with information and knowledge needed to mix a medication in order to obtain a specific concentration dose, to convert measurements from the apothecary system to the metric system and vice versa, to calculate doses needed for pediatrics or adults, to mathematically adjust the dose in case of renal or hepatic compromise, etc.. The skill to do such calculations is obtained via exercises and case solving delivered in class.
PHAR250	Pharmacy Practice ,History & Ethics	3	This course emphasizes upon the historical background and ethical principles of the profession of pharmacy, past and future. By the end of this course, the student will become familiar with the main events and evolution of the profession of pharmacy till the introduction of the clinical pharmacy concept. The practice section introduces students to the practice of pharmacy and to the different medicinal agents and their forms. Pharmacy students will become familiarized with common medical abbreviations used in the profession of pharmacy. Legal procedures that lead to drug marketing, drug withdrawal or recall in the United States will be defined. Ethical dilemmas are part of everyday routine for the pharmacist especially in the social environment we live in. Professional conduct and a high standard of morals are required at all times. Ethical issues relating to the practice if pharmacy will be discussed and each student will have the opportunity to participate in a debate related to sensitive matters he/she might encounter in his/her career
PHAR200	Introduction to Drug Information	2	This course will prepare the student to utilize, retrieve, interpret and allocate information from 1ry, 2ry and 3ry literature useful to their practice and in their future clinical rotations. The student will evaluate the literature and will learn how to critic journal article. The pharmacy student will also have the opportunity to learn how to write drug consults, hospital notes and article evaluations for journal club purposes.

PHAR205	Quantitative Analysis	2	This course covers methods associated with quantitative analytical techniques. It emphasizes the quantitative determination of substances using spectroscopic analysis, analytical separations, chromatography, and electrochemical methods: potentiometry, voltammetry, and coulometry. Laboratory stresses use of methods and instrumental techniques for quantitative chemical analysis.
PHAR407L	Pharmaceutical/Biotechnology Lab	1	Pharmaceutical analysis is a branch of chemistry, which involves the series of processes for identification, determination, quantitation and purification of compounds. This field employs modern instrumentation in bio- and product analysis. Instruments are used to measure physical properties not typically examined with classical analytical techniques to distinguish the constituents and the concentrations of constituents in a given sample. The growth of instrumental analysis will continue as new methods and new instruments are developed. This course introduces students to concepts of various modern instrumental analytical techniques used in pharmaceutical research and industry. Basic principles, components, and operation of each technique are presented in lectures and laboratory sessions. The course covers the basic principles of each method, mathematical treatment, laws, calculation, advantages and limitations and finally, the applications. Focus is done on application in the field of pharmaceutical analysis.
PHAR472	Drug Dosage Form II	3	This is the second course in the pharmaceuticals Dosage Forms sequence. It deals with the design, formulation, manufacture, and testing of complex and novel dosage forms and drug delivery systems that were not covered in Dosage Forms I. Namely, dosage Forms II elaborates suppositories, inserts, liquid and disperse systems, with focus on their types, formulation and quality control.
PHAR472L	Compounding Lab	1	This is the second course in the pharmaceuticals Dosage Forms sequence. It deals with the design, formulation, manufacture, and testing of complex and novel dosage forms and drug delivery systems that were not covered in Dosage Forms I. Namely, dosage Forms II elaborates suppositories, inserts, liquid and disperse systems, with focus on their types, formulation and quality control.
PHAR435	Dermatology and Cosmetology	3	This course introduces the future pharmacist to important aspects of dermatologic diseases, focusing on their common presentation and their relevant pharmacotherapy among other treatment options. The course addresses the assessment, treatment and referral of disorders affecting the skin, nail, hair or mucous membranes. This course takes into consideration the structure and function of the skin and other target organs for cosmetic products application. Moreover, it studies the skin, hair and nail physiology, problems, diagnostics, treatment and prophylaxis, Dermo-cosmetic ingredients and formulations, remedies of beauty.

General Education Requirements

Code	Title	Credits	Description
ENGL251	Communication Skills	3	The objectives of this course are to improve students' writing skills for academic purposes by developing effective use of grammatical structures; analytical and critical reading skills; a sensitivity to rhetorical situation, style, and level of diction in academic reading and writing; and competence in using various methods of organization used in formal writing.

ENGL201	Composition and Research Skills	3	This course focuses on the development of writing skills appropriate to specific academic and professional purposes; the analysis and practice of various methods of organization and rhetorical patterns used in formal expository and persuasive writing; the refinement of critical reading strategies and library research techniques; and the completion of an academically acceptable library research paper. Prerequisites: ENGL150, ENGL151.
CULT200	Introduction to Arab - Islamic Civilization	3	The purpose of this course is to acquaint students with the history and achievements of the Islamic civilization. Themes will include patterns of the political and spiritual leadership; cultural, artistic, and intellectual accomplishments Prerequisites: ENGL051, ENGL101, ENGL151.
CSCI200	Introduction to Computers	3	The course aims at making students competent in computer-related skills. It is supposed to develop basic computer knowledge by providing an overview of the computer hardware and basic components as well as hands-on practice on common software applications such as Word, Excel, Power Point, Internet and Email. The student will learn how to use the new features of Microsoft Office 2010 mainly Word documents, Excel spreadsheets and PowerPoint presentations. On the surface, MS Office 2010 looks a lot different than previous versions (no more menus or toolbars!), but by learning to understand the dramatically changed, Ribbon-based interface, you'll quickly get back on the road to productivity.
ARAB200	Arabic Language and Literature	3	This course is a comprehensive review of Arabic Grammar, Syntax, major literature and poetry styles, formal and business letters.
MATH245	Statistics for Health Sciences	3	General introduction to statistical methods used in the health, biological, biomedical sciences, pharmacy and medical sciences. Topics include research methods and design, descriptive statistics, performance characteristics of diagnostic tests, graphical methods, probability, estimation, hypothesis testing, p-values, regression and correlation, and clinical trials. Prerequisite: ENGL 150

Core Requirements

Code	Title	Credits	Description
CHEM300L	Organic Chemistry Lab	2	Basic experimental techniques in organic chemistry such as melting points, boiling points, distillation, extraction, chromatography; synthesis, separation and purification of some organic compounds. Co-requisites: CHEM 300
CHEM300	Organic Chemistry II	3	This course is the bulk of under graduate organic chemistry. Mechanism in organic chemistry such as SN1, SN2, E1 and E2 and free radical chemistry will be the key focus of this course combined with comprehensive study of structure and reactivity of functional groups: the chemistry of alcohols, phenols, aromatics, ethers, aldehydes, ketones, amines, carboxylic acids, and their derivatives such as esters and amides. The strategic approach for organic chemistry synthesis, structure elucidation, and mechanistic study by spectroscopic methods will also be investigated. Prerequisite: CHEM 250.
CHEM250	Organic Chemistry I	3	Organic Chemistry will be classified into families, and the physical and chemical properties of each family will be discussed. Organic reactions will be viewed for their synthetic value, and Mechanistic Theory of Reactions and Structural Theory will be applied. A review of basic concepts of molecular structure, chemical bonding, molecular geometry, electronic and atomic structure, and acid-base chemistry, in addition to basic chemistry of alkanes, alkenes and alkyne families will be a main focus in this course. The value of stereochemical isomers will be stressed including conformational, geometrical and optical isomers. Prerequisite: CHEM 200.
CHEM200L	General Chemistry Lab	1	The laboratory work involves hands-on experience with chemical systems. Experiments include basic calorimetry, a limited qualitative and quantitative analysis scheme, properties of gases, acid-base and redox titrations. Co-requisites: CHEM 200

CHEM200	General Chemistry	3	Basic principles of chemistry, electronic structure of the atom, chemical periodicity, molecular structure and bonding, acids and bases and the states of matter, rates of chemical reactions, and chemical equilibrium are covered in this course. Prerequisites: ENGL 150; CHEM, or S grade on the Chemistry Placement Test Prerequisites: CHEM160, ENGL101. Co-requisites: CHEM200L.
BMED445	Pathophysiology	3	This course studies the mechanisms, etiologies, risk factors and complications of diseases processes. It emphasizes on the clinical signs and symptoms, history, prognosis and epidemiology of diseases. Study of pathological imbalances including cellular adaptation and injury, fluid compartment exchanges with edema and dehydration, electrolyte functions, control and imbalances, acidosis and alkalosis, nervous system injuries and responses, sensory imbalances, skeletal system injury and repair, soft tissue injury and repair, and muscle injury and dysfunction. Prerequisites: BIOL 345 & BIOL 385
BIOL385L	Microbiology Lab	1	Sterile techniques, media preparation, streaking, identification, isolation and purification of different bacterial strains are performed. Co-requisites: BIOL 385
BIOL385	Microbiology	3	Characteristics of microorganisms and parasites - emphasizing mechanisms by which they cause disease in humans. Prerequisites: BIOL 200
BIOL360L	Human Physiology & Anatomy Lab	1	Human Physiology & Anatomy Lab
BIOL360	Human Physiology & Anatomy	4	Studies the structure and function of the following body systems: blood, lymphatic, cardiovascular, respiratory, digestive, urinary, and reproductive. Prerequisites: BIOL200
BIOL200L	General Biology I Lab	1	This lab course introduces principles of microscopy with emphasis on viewing different animal tissues and cells. A detailed study of the animal kingdom including evolution, classification, and anatomical morphology. Co-requisites: BIOL 200
BIOL200	General Biology I	3	An introductory level course to energy transfer through living organisms, cell biology, membrane transportations, genetics, human physiology, evolution, and morphology and physiology of organ systems, understanding diversity with emphasis on the animal kingdom and evolution. Protozoans are also studied. Prerequisites: ENGL 150; BIOL 150, or S grade on the Biology Placement Test
BIOC310	Medical Biochemistry	4	Medical Biochemistry is designed to present the basics of biochemistry, thus including a study of structure of amino acids, carbohydrates, lipids, proteins, enzymes, and nucleotides, in addition to their metabolism, bioenergetics, membranes and signaling systems, integration and regulation of the major metabolic pathways, nitrogen metabolism, myoglobin, hemoglobin, and hemostasis, with emphasis on the biochemical basis of human disease. Prerequisite: BIOL 200 & CHEM 250

Major Electives

Code	Title	Credits	Description
PHAR500	Pharmacy Elective I	3	The course provides an overview on the assessment of the nutritional needs of healthy individuals and patients with different medical conditions. It emphasizes the role of vitamins, minerals, and trace elements in maintaining health and treating illnesses. The course allows the student to suggest a dietary plan with the proper composition and amounts of nutrients taking into consideration the hydration status, kidney function, body weight, and other medical conditions that influence selection.
PHAR550	Pharmacy Elective II	3	This course describes the basic medical emergencies that a pharmacist may encounter in daily life. The student will know the necessary equipments needed for emergency work up. The course will allow the student properly evaluate the real status of the patient during emergency, assesses the risk of a patient, identify the urgency of a problem, and how to provide first medical aid.