Faculty of

Pharmacy

Faculty of Pharmacy

History

Faculty of Pharmacy at Beirut Arab University was established in 1986, in Beirut, the capital of Lebanon. The undergraduate program at the Faculty of Pharmacy started and progressed to include seven academic departments:

- Analytical Chemistry & Drug Quality Control
- Pharmaceutical Chemistry
- Pharmacognosy & Medicinal Plants
- Pharmaceutics & Pharmaceutical Technology
- Pharmacology
- Pharmaceutical Microbiology
- Clinical Pharmacy

The faculty has observed considerable growth in number of its students that increased from a total number of 115 in 1986 to a total of 408 in the academic year 2009 / 2010.

Since 2002, the faculty has been expanding its curriculum to incorporate postgraduate programs including: Master and PhD Degrees, in addition to a Diploma in Clinical Pharmacy and Doctor in Pharmacy (Pharm.D.) programs.

Since its establishment, the faculty has adopted the extended academic year system, then in 1999, it moved to the two academic terms scheme. In 2002, the faculty updated its programs and adopted the "Credit Hour System". The curriculum of this new system prepares students for careers in different domains of Pharmacy and promotes interaction between pharmacists and other health professionals. Currently, a thorough inspection of the current curriculum is on-going for improvement to meet the national and international needs.

Moreover, the faculty established a "Pharmaceutical Continuing Education Program" which includes short courses, seminars and presentations in the various Pharmaceutical fields that offer graduates and the community a venue for maintaining up - to - date knowledge.

Vision

To be recognized as a premier academic institution in pharmacy education, academic research and community involvement.

Mission

Faculty of Pharmacy at Beirut Arab University, is an educational and scientific Lebanese institution committed, since its foundation in 1986, to provide advanced services in pharmaceutical education, research, and training, to prepare competent pharmacists capable of effective participation in different pharmacy domains locally, regionally, and internationally, life - long self learning, and the establishment of a strong relationship with the surrounding society in frame of professional code of ethics. To achieve its mission, Faculty of Pharmacy depends on highly qualified staff members, distinguishable laboratory facilities and modern educational tools.

Undergraduate Program

The Faculty offers a Bachelor Degree (B.Sc.) in "Pharmaceutical Sciences" in which the standard duration of study is ten semesters.

Program Description

The degree requirements consist of a total of 182 Credit Hours taken as follows:

Faculty Requirements

Mandatory Courses - 154 Cr. Hr. divided into:
a- Basic sciences related courses - 19 Cr. Hr.
Biology, Mathematics, Anatomy and Histology, Physiology, Pharmaceutical Physical Chemistry, Pharmaceutical General Chemistry and Botany and Medicinal Plants.
b- Professional Courses - 131 Cr. Hr.
Pharmaceutics, Pharmacognosy, Pharmaceutical Analytical Chemistry, Pharmaceutical Organic Chemistry, Pharmaceutical Microbiology, Biochemistry, Medicinal Chemistry, Phytochemistry, Community Pharmacy, Pharmacology, Toxicology, Industrial Pharmacy, Medical Microbiology, Biopharmaceutics and Pharmacokinetics, Bioassay ,Clinical Pharmacy, Hospital Pharmacy and Pharmacy Laws.
c- Professional Pharmacy Training - 4 Cr. Hr. [equivalent to a period of 12 months professional training].
Students must successfully complete a 12 months of "Professional Training Program" offered by the faculty under the supervision of the academic staff members nominated by the faculty board. Training is divided over 4 summer semesters starting at the end of the first year.

Faculty Elective Courses - 12 Cr. Hr.
Courses related to the recent advancement in different pharmacy domains. They include: Therapeutics [I - VI], professional pharmacy practice, biotechnology and genetic engineering, and pharmacogenomics in disease management.

General University Requirements - 16 Cr. Hr. divided into:
University Mandatory Courses - 7 Cr. Hr.
University Elective Courses - 9 Cr. Hr.

Bachelor of Pharmacy (182 Cr. Hr.)

Curricula

First Semester			Cr.
PHAR	101	Botany & Medicinal Plants	3
PHAR	103	Pharmaceutical General Chemistry	3
PHAR	105	Pharmaceutical Physical Chemistry	2
PHAR	107	Pharmaceutical Organic Chemistry I	3
BIOL	107	Biology	2
		Elective (General)[1]	4
			17

Second Semester			Cr.
PHAR	102	Pharmacognosy I	3
PHAR	104	Pharmaceutical Analytical Chemistry I	3
PHAR	108	Pharmaceutical Organic Chemistry II	3
MEDC	116	Anatomy & Histology	3
MATH	106	Mathematics	2
		Elective (General)[1]	4
			18
PHAR	109	Professional Pharmacy Training I	1

Third Semester			Cr.
PHAR	201	Introduction to Pharmaceutics	3
PHAR	203	Pharmaceutical Analytical Chemistry II	3
PHAR	205	Pharmaceutical Organic Chemistry III	3
PHAR	207	Pharmacognosy II	3
PHAR	209	Physiology I	2
		Elective (General)[1]	4
			18

Fourth Semester			Cr.
PHAR	202	Physical Pharmacy	3
PHAR	204	Pharmaceutical Analytical Chemistry III	3
PHAR	206	Pharmaceutical Organic Chemistry IV	3
PHAR	208	Pharmacognosy III	3
PHAR	210	Physiology II	2
		Elective (General)[1]	4
			18
PHAR	211	Professional Pharmacy Training II	1

Fifth Semester			Cr.
PHAR	301	Pharmaceutics	3
PHAR	303	Instrumental Analysis	3
PHAR	305	Isolation & Identification of Natural Products	3
PHAR	307	Pharmaceutical Microbiology I	3
PHAR	309	Biochemistry I	3
PHAR	311	Medicinal Chemistry I	3
			18

Sixth Semester			Cr.
PHAR	302	Design & Formulation of Drug Delivery Systems	3
PHAR	304	Nutropharmaceutical & Cosmetics Analysis	3
PHAR	306	Medicinal Chemistry II	3
PHAR	308	Phytochemistry I	3
PHAR	310	Pharmaceutical Microbiology II	3
PHAR	312	Biochemistry II	3
			18
PHAR	313	Professional Pharmacy Training II	1

Seventh Semester			Cr.
PHAR	401	Principles & Kinetics of Drug Stability	3
PHAR	403	Medicinal Chemistry III	3
PHAR	405	Phytochemistry II	3
PHAR	407	Pharmacology I	3
PHAR	409	Medical Microbiology	3
PHAR	411	Industrial Pharmacy	3
			18

Eighth Semester			Cr.
PHAR	402	Biopharrmaceutics & Pharmacokinetics	3
PHAR	404	Medicinal Chemistry IV	3
PHAR	406	Evaluation of Crude Drugs	3
PHAR	408	Pharmacology II	3
PHAR	410	Parasitology & Pathology	3
PHAR	412	Public Health	1
		Elective [2]	2
			18
PHAR	413	Professional Pharmacy Training IV	1

Ninth Semester

			Cr.
PHAR	501	Community Pharmacy & Pharmaceutical Legislations	3
PHAR	503	Microbiological Quality Control	2
PHAR	505	Clinical Pharmacy I	3
PHAR	507	Biological Evaluation & Screening of Drugs	3
PHAR	509	Pharmaceutical Technology	3
		Elective [3]	3
			17

Tenth Semester

			Cr.
PHAR	502	Hospital Pharmacy	3
PHAR	504	Toxicology & First Aid	3
PHAR	506	Physico - Chemical Quality Control	2
PHAR	508	Clinical Pharmacy II	3
		Elective [3]	7
			18

[1] A total of 16 credits is required as General University Requirements; 7 credits are selected from the University Mandatory courses list including: ARAB 001 (2 Cr.), ENGL 001 (2 Cr.), CMPG 001 (2 Cr.), BLAW 001 (1 Cr.) and another 9 credits are selected from the University Elective courses list.

[2] Chosen from the 400 level courses offered by the faculty.

[3] Chosen from the 500 level courses offered by the faculty.

Mandatory Courses

PHAR 101 - Botany & Medicinal Plants (3 Cr. : 2 Lec : 2 Lab)

Taxonomical approach to study of plant families, Thallophytes, embryophytes, systematic botany and taxonomy of higher plants. Plant physiology (metabolic plant cell, enzymes, synthesis of food reserves, photosynthesis and respiration). Plant body cell types and cell differentiation. Morphology and anatomy of medicinal flowering plants.

PHAR 102 - Pharmacognosy I (3 Cr. : 2 Lec : 2 Lab)

Introduction to Pharmacognosy. Cell contents (primary and secondary metabolites). Introduction to medicinal leaves, stems, flowers, fruits, roots and rhizomes. Medicinal flowers (cloves, chamomile, calendula, lavender, pyrethrum, arnica, etc...).

PHAR 103 - Pharmaceutical General Chemistry (3 Cr. : 2 Lec : 2 Lab)

Chemical bonding, chemical equilibria, solubility products, complex ions, buffer solutions. Importance of buffers in pharmaceutical dosage forms. applications to the drug absorption.

PHAR 104 - Pharmaceutical Analytical Chemistry I (3 Cr. : 2 Lec : 2 Lab)

Qualitative analysis for certain pharmaceutical inorganic salts and their mixtures. Introduction (electrolytes, solubility products, complex formation), analysis of basic radicals, analysis of acid radicals.

PHAR 105 - Pharmaceutical Physical Chemistry (2 Cr. : 2 Lec : 1 Tut)

Liquids, solutes of nonelectrolytes and electrolytes, colligative properties, colloids and its use in drug formulation, thermochemistry and thermodynamics and applications to drug stability.

PHAR 107 - Pharmaceutical Organic Chemistry I (3 Cr. : 2 Lec : 2 Lab)

Introduction, Alkanes, Stereochemistry, Alkenes, Alkynes and Conjugated Dienes, Alkyl halides.

PHAR 108 - Pharmaceutical Organic Chemistry II (3 Cr. : 2 Lec : 2 Lab)

Alcohols and Ethers, Aromaticity: Benzene and Arenes, Aryl halides, Carbonyl compounds, Aldehydes and Ketones, α, ß - Unsaturated carbonyl compounds.

PHAR 109 - Professional Pharmacy Training I (3 Months Summer Training = 1Cr.)

Principles of pharmacy and pharmacy management, arranging different pharmaceutical dosage forms, and recognition of their location in the pharmacy.

PHAR 201 - Introduction to Pharmaceutics (3 Cr. : 2 Lec : 2 Lab)

Survey of the professional pharmacy, dealing with its history, educational requirements, organization, regulation and current developments. Drug information resources, pharmaceutical and medicinal terminology, routes of drug administration. Introduction to technical aspects of drug dispensing and pharmaceutical calculation. Liquid dosage forms.

PHAR 202 - Physical Pharmacy (3 Cr. : 2 Lec : 2 Lab)
The application of physical chemistry principles to pharmaceutics: Solubility and distribution phenomena, interfacial phenomena, colloids, suspension, emulsions, rheology and micrometrics. Prereq.: PHAR 201.

PHAR 203 - Pharmaceutical Analytical Chemistry II (3 Cr. : 2 Lec : 2 Lab)
An introduction to quantitative analysis, gravimetry, volumetry including neutralization, precipitation and complexation titration. Prereq.: PHAR 104.

PHAR 204 - Pharmaceutical Analytical Chemistry III (3 Cr. : 2 Lec : 2 Lab)
Redox reactions as a base for electrochemistry. Theoretical background of redox reaction, applications to quantitative analysis. Potentiometry and conductometry. Prereq.: PHAR 203.

PHAR 205 - Pharmaceutical Organic Chemistry III (3Cr.:2Lec,2Lab)
Carboxylic acids and their derivatives, Nitrogenous compounds, Nitro compounds, Amines and diazonium salts, Phenols and Quinones, Sulfonic acids and sulfonamides, Cycloalkanes, and carbohydrates. Prereq.: PHAR 107, 108.

PHAR 206 - Pharmaceutical Organic Chemistry IV (3 Cr. : 2 Lec : 2 Lab)
Aminoacids and peptides, Polynuclear aromatic hydrocarbons, Spectroscopy, Heterocyclic compouds: Aromatic five - and six - membered rings, mono - and di - hetero and their benzo derivatives, principles of synthesis of some important classes of drugs, polymers. Prereq.: PHAR 205.

PHAR 207 - Pharmacognosy II (3 Cr. : 2 Lec : 2 Lab)
Study of the important drugs derived from, seeds, leaves, herbs, barks and woods. Active constituents medicinal uses and qualitative chemical test. Diagnostic macro - and microscopical characteristics, detection of adulteration. Prereq.: PHAR 102.

PHAR 208 - Pharmacognosy III (3 Cr. : 2 Lec : 2 Lab)
Study of the important drugs derived from fruits, subterranean organs. Active constituents medicinal uses and qualitative chemical test, unorganized drugs, surgical dressings and sutures. Diagnostic macro - and micorscopical characteristics. Detection of adulteration. Prereq.: PHAR 207.

PHAR 209 - Physiology I (2 Cr. : 2 Lec)
Introduction to physiology, blood, autonomic nervous system, excitable system, and endocrine system.

PHAR 210 - Physiology II (2 Cr. : 2 Lec)
Cardiovascular system, gastrointestinal system, reproductive and respiratory system, renal system and central nervous system.

PHAR 211 - Professional Pharmacy Training II (3 Months Summer Training = 1Cr.)
Recognition of different kinds of drugs that can be handled over the counter and without medical prescription, methods of storage of drugs and markers of possible expiration, uses of herbal drugs, tea bags, dietary supplements and natural skin care products.

PHAR 301 - Pharmaceutics (3 Cr. : 2 Lec : 2 Lab)
Formulation and quality control aspects of tablets, capsules, suppositories, parentrals, ophthalmic, and semisolid products. Prereq.: PHAR 202.

PHAR 302 - Design & Formulation of Drug Delivery Systems (3 Cr. : 2 Lec : 2 Lab)
Principle of design and formulation problems encountered with the different types of dosage forms. Modified release drug delivery systems. Prereq.: PHAR 301.

PHAR 303 - Instrumental Analysis (3 Cr. : 2 Lec : 2 Lab)
Absorption and emission spectrophotometry in quantitative analysis of pharmaceuticals. Spectrophotometry, colorimetry, fluorimetry, atomic absorption spectroscopy, flame photometry, electrochemical methods of analysis including polarography. Prereq.: PHAR 204.

PHAR 304 - Nutropharmaceuticals & Cosmetics Analysis (3 Cr. : 2 Lec : 2 Lab)
Composition and chemistry of the nutropharmaceuticals and cosmetic substances including amino acids, proteins, lipids, carbohydrates, preservatives, colorants, sweeteners. Physico - chemical methods of analysis of nutropharmaceuticals and cosmetics. Chemical composition and methods of water analysis. Types of water used in pharmacy. Physico - chemical methods of analysis of oils and fats. Prereq.: PHAR 303.

PHAR 305 - Isolation & Identification of Natural Products (3 Cr. : 2 Lec : 2 Lab)
Chromatography (theoretical concept of chromatography, different types of chromatography, techniques of chromatography, applications). Spectroscopy (spectroscopic methods for identification, characterization and quality control of natural products). Prereq.: PHAR 208.

PHAR 306 - Medicinal Chemistry II (3 Cr. : 2 Lec : 2 Lab)
Chemical and biological principles governing the properties of drugs. Drugs categories include: Antiinfective agents (alcohols, aldelydes, phenols, oxidizing agents, halogen containing compounds, dyes, preservatives), antineoplastic, antifungal, antiviral, anthelmentics, antiprotozoal, antiseabious and diagonistic agents. Prereq.: PHAR 311.

PHAR 307 - Pharmaceutical Microbiology I (3 Cr. : 2 Lec : 2 Lab)
General microbiology and microbial genetics. Sterilization of pharmaceuticals; Methods of sterilization, validation of sterilization methods, sterility testing. Prereq.: BIOL 107.

PHAR 308 - Phytochemistry I (3 Cr. : 2 Lec : 2 Lab)
Classes of bioactive constituents of crude drugs (carbohydrates, glycosides, essential oils, and miscellaneous natural products), definition, classification, preparation, molecular structure, physical and chemical characteristics, action,

SAR, methods of quantification. Prereq.: PHAR 305.

PHAR 309 - Biochemistry I (3 Cr. : 2 Lec : 2 Lab)

Introduction to biochemistry, structure and function of carbohydrates and their metabolism. Enzyme kinetics, specificity and Allosteric regulation. Vitamins and co enzymes. Electron transport chain. DNA and genes, central dogma, gene expression and regulation of gene expression. Prereq.: PHAR 210.

PHAR 310 - Pharmaceutical Microbiology II (3 Cr. : 2 Lec : 2 Lab)

A survey of the immune system and immune response with special emphasis on vaccine development. Chemotherapeutic agents and mechanism of microbial resistance; Disinfectants and antiseptics; Industrial microbiology. Prereq.: PHAR 307.

PHAR 311 - Medicinal Chemistry I (3 Cr. : 2 Lec : 2 Lab)

Fundamentals of medicinal chemistry and an introduction to the properties of physiochemical drugs relative to their biological effects. Chemical and biochemical aspects of certain drug categories including: Antibiotics and anti - infective agents (antibacterial sulfonamides, quinolones, antitubercular agents and antileprotic agents). Prereq.: PHAR 206.

PHAR 312 - Biochemistry II (3 Cr. : 2 Lec : 2 Lab)

Structure and function of lipids and their metabolism, lipoprotein metabolism, amino acid structure and metabolism. Nucleotide metabolism. Prereq.: PHAR 206, 210.

PHAR 313 - Professional Pharmacy Training III (3 Month Summer Training = 1Cr.)

Recognition of characteristics of medical laboratory analysis results, dealing with different kinds of drugs that are used for treatment of acute and chronic diseases prescribed by physicians, handling of different kinds of vaccines, antibiotics and related preparations, expectation of different drug interactions either natural or synthetic.

PHAR 401 - Principles & Kinetics of Drug Stability (3 Cr. : 2 Lec : 3 Lab)

Routes of drug degradation, principles and kinetics of chemical degradation. Factors influencing drug stability, stability testing and predication of shelf life. Prereq.: PHAR 302.

PHAR 402 - Biopharmaceutics & Pharmacokinetics (3 Cr. : 2 Lec : 3 Lab)

Mathematical characterization of the processes of absorption, distribution and elimination of drugs. The application of biopharmaceutics and pharmacokinetics, theory to dosage regimen adjustment, drug product selection, bioavailability and bioequivalence. Prereq.: PHAR 401.

PHAR 403 - Medicinal Chemistry III (3 Cr. : 2 Lec : 2 Lab)

Chemical and biological aspects of certain drugs including: Drugs acting on CNS (depressants and stimulants), drugs used to treat pain, inflammation and arthritis, opioid analgesics and antagonists, drugs affecting the immune system (antihistamines, H2 - receptor antagonists), insulin and oral hypoglycemic, thyroid drugs and calcium homeostais. Prereq.: PHAR 306.

PHAR 404 - Medicinal Chemistry IV (3 Cr. : 2 Lec : 2 Lab)

Chemical and biological aspects of certain drugs including: Cardiovascular drugs, diuretics, drugs used to treat respiratory tract disorders, gastrointestinal drugs, drugs affecting neurotransmission (cholinergic agonists and antagonists, adrenergic agonist & antagonists, serotonin receptor drugs), local anaesthetics, vitamins and drugs used to treat neuromuscular disorders. Prereq.: PHAR 403.

PHAR 405 - Phytochemistry II (3 Cr. : 2 Lec : 3 Lab)

Study of medicinal plant alkaloids, chromones and coumarins, tissue culture and cell suspension techniques and application for production of bioactive natural products. Prereq.: PHAR 308.

PHAR 406 - Evaluation of Crude Drugs (3 Cr. : 2 Lec : 2 Lab)

General biosynthetic pathways of secondary metabolites, microbial biotransformation. Evaluation of crude drugs, production, quality control of herbal drugs (herbal pharmacopoeias). Prereq.: PHAR 405.

PHAR 407 - Pharmacology I (3 Cr. : 2 Lec : 3 Lab : 1 Tut)

General principles, drugs acting at the synaptic and neuroeffector transmission, autocoids including histamine, kinins, eicosanoids, angiotensins, serotonin, peptides and others. Local anesthetics, and drugs acting on the blood. Prereq.: PHAR 312.

PHAR 408 - Pharmacology II (3 Cr. : 2 Lec : 3 Lab : 1 Tut)

Drugs affecting renal function, cardiaovascular pharmacology and gastrointestinal tract. Drugs acting on the central nervous system, in bronchial asthma, in allergic disorders, NSAIDS. Cancer chemotherapy and chemotherapeutic agents. Prereq.: PHAR 407.

PHAR 409 - Medical Microbiology (3 Cr. : 2 Lec : 2 Lab)

Study of the etiology, pathogenesis, clinical picture, epidemiology, treatment with emphasis on prevention and control of common infectious diseases caused by bacteria, fungi, and viruses. Prereq.: PHAR 310.

PHAR 410 - Pathology & Parasitology (3 Cr. : 2 Lec : 2 Lab)

An introduction to general pathology and neoplasia: Inflammation, cell injury, circulatory disturbances, infectious diseases and neoplasia with special emphasis on the etiology of cancer. An introduction to medical parasitology, referring to some examples of common parasitic infections. Prereq.: PHAR 409.

PHAR 411 - Industrial Pharmacy (3 Cr. : 2 Lec : 2 Lab)

Introduction, quality control and GMP regulations. Unit operations (heat transfer, evaporation, drying, crystallization, filtration, centrifugation, size reduction and separation, refrigeration, extraction, mixing and emulsification), air purification, materials of plant construction.

PHAR 412 - Public Health (1 Cr. : 1 Lec)

Protecting and improving the health of community, as by preventative medicine, health education, control of communicable diseases application of sanitary measures, and monitoring of environmental hazards. Prereq.: PHAR 409.

PHAR 413 - Professional Pharmacy Training IV (3 Month Summer Training = 1Cr.)
Management of quality assurance and quality control of drugs during the manufacture process, developing different skills related to clinical pharmacy regarding different aspects including patients counseling and dosage regimens, developing efficient pharmacy practice through further prediction of possible drug interactions either synthetic or natural, management of collection of data concerning different drugs through dealing with the drug information center at the "Order of Pharmacist".

PHAR 501 - Community Pharmacy & Pharmaceutical Legislations (3 Cr. : 2 Lec : 2 Lab : 1 Tut)
Good dispensing practice for non - prescription (OTC) products. Appropriate product selection, monitoring and patient information ethics, communications and legislations. Prereq.: PHAR 402.

PHAR 502 - Hospital Pharmacy (3 Cr. : 2 Lec : 3 Lab)
Administrative and professional principles. Concepts and trends affecting hospital pharmacy. Hospital pharmaceutical services: Medication - Based services, patient care and specialized services. Prereq.: PHAR 501.

PHAR 503 - Microbiological Quality Control (2 Cr. : 1 Lec : 2 Lab)
Quality control of drug and bioproducts, monographs (microbiological) from pharmacopoeia.

PHAR 504 - Toxicology & First Aid (3 Cr. : 2 Lec : 2 Lab : 1 Tut)
General principles. Factorial, experimental and reproductive toxicology and teratogenicity. Genetic toxicology, chemical carcinogenesis, food and drug poisoning. Social, clinical, military and target organs. Environmental, industrial, radiation and forensic toxicology.

PHAR 505 - Clinical Pharmacy I (3 Cr. : 2 Lec : 3 Lab : 1 Tut)
Pharmaceutical care, application, interpretation of clinical data, pathophysiology, information resources, side effects, drug induced diseases, drug interaction and contraindication. Pharmacotherapy in special population, clinical PCK and applications with aminoglycosides, digoxin, theophylline, lithium and diphenylhydantion. Prereq.: PHAR 402 and PHAR 408.

PHAR 506 - Physico - Chemical Quality Control (2 Cr. : 1 Lec : 2 Lab)
Control charts, methods assessment and selection, types of error, quality control of chemical drug and bioproduts, monographs (chemical) from recent pharmacopoeiae. Prereq.: PHAR 304.

PHAR 507 - Biological Evaluation & Screening of Drugs (3 Cr. : 2 Lec : 3 Lab)
Organization of blind screening, screening of cholinomimetics, antimuscarinic drugs, adrenomimetics and antagonists, NSAIDs skeletal muscle relaxants, CNS drugs, cardiovascular drugs, hormones and their antagonists. Prereq.: PHAR 408.

PHAR 508 - Clinical Pharmacy II (3 Cr. : 2 Lec : 3 Lab : 1 Tut)
Therapeutics; Cardiology, internal medicine, rheumatology and hematology, oncology, neurology and psychiatry. Case studies and monitoring. Prereq.: PHAR 505.

PHAR 509 - Pharmaceutical Technology (3 Cr. : 2 Lec : 2 Lab)
Powder technology (granulation and pelletization), tableting, tablets and pellets coating, capsules, parenteral products, aerosols, suppositories, semisolids (topical preparations), encapsulation, preformulation, packaging of pharmaceutical products. Prereq.: PHAR 411.

Faculty Electives

PHAR 420 - Cell & Molecular Biology (2 Cr. : 2 Lec)
Study of the molecular basis of the cell, cell structure, chromosomes, recombination and karyotyping.

PHAR 424 - Modern Theories in Biological Analysis (2 Cr. : 2 Lec)
Theory and practice of selected modern methods used in pharmaceutical analysis and analysis of biological samples. A study of the methods used to determine stability characteristics of drugs.

PHAR 426 - Herbal Medicine (2 Cr. : 2 Lec)
It deals with the problems arising from lack of professional knowledge about drugs and the impact of herbal remedies on drug discovery. Guidelines for the photochemical and biological screening of medicinal plants utilized in folk medicine and for registration of herbal remedies will be considered.

PHAR 428 - Selected Topics in Pharmacolgy (2 Cr. : 2 Lec)
Non adrinergic - non cholinergic transmission, drugs in liver and renal diseases, gene therapy and immunotherapy.

PHAR 430 - Pharmacotherapeutics I (2 Cr. : 1 Lec : 2 Lab : 1 Tut)
Pulmonary disorders: Asthma, chronic obstructive pulmonary, drug - induced pulmonary diseases, cystic fibrosis. Rheumatology and bone disorders: Osteoporosis and osteomalacia, rheumatoid arthritis, osteoarthritis, gout and hyperuricemia. Gastroenterology: Peptic ulcer, disease and gastroesophageal reflux disease, inflammatory bowel diseases, liver diseases, portal hypertension and cirrhosis, nausea, vomiting, diarrhea and constipation. Prereq.: PHAR 407.

PHAR 520 - Forensic Pharmacognosy (2 Cr. : 2 Lec)
Plants and natural products that constitute potential health hazards. Drug dependence, narcotic analgesics, psychoenergetics and hallucinogens of plant origin. Mycotoxins as a serious threat to general health and safety of the community. Hair and fibers as significant evidence in crime investigation.

PHAR 522 - Pharmacotherapeutics II (3 Cr. : 2 Lec : 2 Lab)
Cardiovascular disorders: Heart failure, hypertension, arrhythmias, Ischemic heart diseases Thromboembolism,

stroke. Nephrology: Acute renal failure, chronic kidney disease: Hemodialysis and peritoneal dialysis, drug - induced kidney disease, electrolyte and acid - base disorders, urologic disorders: Erectile dysfunction, management of benign prostatic hyperplasia urinary Incontinence. Prereq.: PHAR 408.

PHAR 523 - Veterinary Pharmacy (2 Cr. : 2 Lec)

This course exposes pharmacy students to the subjects of animal breeding, zoonoses and veterinary medicine, and how pharmacist relate to this particular environment. Emphasis will be placed on animal terminology, nomenclature, anatomical and physiological variations between species and major disease entities to include etiology, epidemiology, treatment and control. Upon completion of the course, pharmacy students should be prepared as pharmacists to lend their expertise to veterinarians, country agents, and other agricultural experts in areas relating to animal care and management of disease.

PHAR 524 - Pharmaceutical Biotechnology & Genetic Engineering (2 Cr. : 2 Lec)

Basis of genetic engineering and DNA cloning, applications of recombinant DNA technology. An introduction to the development of proteins and peptide, vaccines and other drug produced by biotechnological techniques involving cell culture and molecular biology. Biotechnology; Safety, social, and ethical considerations.

PHAR 525 - Selected Topics in Drug Design (2 Cr. : 2 Lec)

Introduction to the fundamentals of drug design. Selected topics in medicinal chemistry, the subject matter being drawn from the current literature.

PHAR 526 - Communication Skills for Health Professionals (2 Cr. : 2 Lec)

This course emphasizes oral communication skills for health professionals, from small to large group presentation, development of better oral communication skills will be emphasized as a key to greater personal and professional confidence.

PHAR 528 - Introduction to Epidemiology & Pharmacoepidemiology (2 Cr. : 2 Lec)

Principles of epidemiology, descriptive, analytic and clinical epidemiology, epidemiologic perspective for health care management, epidemiology and the public policy process and pharmacoepidemiology.

PHAR 529 - Pharmacotherapeutics III (3 Cr. : 3 Lec)

Infectious diseases: Antimicrobial regimen selection, central nervous system infections, lower respiratory tract infections, upper respiratory tract infections, skin and soft tissue infections infective endocarditis, tuberculosis, gastrointestinal infections and intraabdominal infections urinary tract infections and prostatitis, sexually transmitted diseases, bone and joint infections sepsis and septic shock, antimicrobial prophylaxis in surgery, human immunodeficiency virus infection, viral infections, superficial fungal infections and invasive fungal infections, parasitic diseases. Hematology: Hematopoiesis, anemias, coagulation disorders, drug - induced, hematologic disorders. Oncology: Cancer treatment and chemotherapy, breast cancer, lung cancer, colorectal cancer, prostate cancer and ovarian cancer, lymphomas and leukemias melanoma, hematopoietic stem cell transplantation. Prereq.: PHAR 408.

PHAR 530 - Pharmacotherapeutics IV (3 Cr. : 3 Lec)

Neurology: Multiple sclerosis, epilepsy and status epilepticus, parkinson's disease, pain management and headache disorders. Psychiatric disorders: Childhood disorders, eating disorders, alzheimer's, schizophrenia, depressive disorders and bipolar disorder, substance - related disorders, anxiety disorders and sleep disorders. Prereq.: PHAR 408.

PHAR 531 - Pharmacotherapeutics V (2 Cr. : 2 Lec)

Endocrinology: Diabetes mellitus, thyroid disorders, adrenal gland disorders, pituitary gland disorders. Women health care: Pregnancy and lactation: Therapeutic considerations, contraception, menstruation - related disorders, endometriosis, hormone therapy in women. Prereq.: PHAR 408.

PHAR 532 - Pharmacotherapeutics VI (2 Cr. : 2 Lec)

Immunology: Function and evaluation of the immune system, systemic lupus erythematosus and other collagen - vascular diseases, allergic and pseudo - allergic drug reactions, solid - organ transplantation. Dermatology: ENT and EYE: Glaucoma, allergic, dermatologic drug reactions, self - treatable skin disorders, and skin cancer, ear disorders, acne vulgaris, psoriasis, atopic dermatitis. Prereq.: PHAR 408.

PHAR 533 - Professional Pharmacy Practice I (1 Cr. : 3 Lab)

Hospital training designed to develop skills in the presentation, discussion and assessment of selected clinical cases using the SOAP (Subjective, Objective, Assessment and Plan) format.

University Requirement Elective Courses

PHAR 001 - Medicinal Herbs (1 Cr. : 1 Lec)

Introduction, historical background, classification of medicinal herbs, immuno - stimulant herbs, herbs used in the treatment of urinary, digestive, and circulatory systems diseases, medicinal herbs and addiction (not offered to pharmacy students).

PHAR 002 - Hormones & their Actions (2 Cr. : 2 Lec)

Introduction, glands and neural components, homeostatic feedback mechanisms, pituitary gland, thyroid gland, parathyroid glands, pancreas, adrenal glands, ovaries and testes.