

Elective courses

المقررات الإختيارية

The Faculty of Pharmacy offers elective courses from which the students are free to select eight credit hours.

Course Code	Course Title	Credit Hours		
		L	P/T	Total
PA E05	Advanced Pharmaceutical Analysis - Spectroscopy	1	1	2
PA E06	Environmental Analysis	1	1	2
PA E07	Forensic Analysis	1	1	2
PB E06	Cancer Biology	1	1	2
PB E07	Radioisotopes in Biochemistry and Medicine	1	1	2
PB E08	Tissue Metabolism	1	1	2
PC E04	Drug Design	1	1	2
PC E05	Medicinal Chemistry of Supplementary Drugs and Nutraceuticals	1	1	2
PC E06	Nanochemistry and Related Aspects	1	1	2
PG E07	Complementary and Alternative Therapies	1	1	2
PG E08	Production and Manufacture of Medicinal Plants	1	1	2
PG E09	Poisonous Plants	1	1	2
PI E02	Applied Industrial Pharmacy	1	1	2
PI E03	Good Manufacturing Practices	1	1	2
PI E04	Drug Manufacturing	1	1	2
PM E05	Molecular Biology and Epigenetics	1	1	2
PM E06	Infection Control	1	1	2
PM E07	Antimicrobial stewardship	1	1	2
PO E07	Biological Standardization	1	1	2
PO E08	Drug Interactions	1	1	2
PP E16	Precision Pharmacy	1	1	2
PP E17	Advanced Pharmaceutical Care	1	1	2
PP E18	Radiopharmacy	1	1	2

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Faculty of Pharmacy, Assiut University, Assiut, 71526, Egypt;

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AU-PHA-CPP-12-01

Pharm-D clinical مقررات

إدارة برنامج الصيدلة الإكلينيكية

PR E04	Recent Techniques of Structure Elucidation	1	1	2
PR E05	Green Chemistry	1	1	2
PR E06	Advanced Level of Drug Synthesis	1	1	2
PT E09	Cosmetic Preparations	1	1	2
PT E10	Clinical Pharmaceutics	1	1	2
PT E11	Drug Targeting	1	1	2

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E-mail: clinic_admin@pharm.aun.edu.eg

المحتوى العلمى للمقررات الدراسية

PA E05 Advanced Analytical Chemistry – Spectroscopy

In this course the pharmaceutical applications of different analytical spectroscopic techniques including UV, Visible spectrometry, Fluorimetry, IR, NMR and MS in the quality control laboratories will be studied. A brief introduction about the instrumentation of these analytical spectroscopic techniques will be presented as well.

PA E06 Environmental Analysis

In this context, analysis of different environmental samples such as water, sewage, air, dust particles will be covered. Different analytical techniques which are closely associated with the environmental analysis will be discussed in details.

PA E07 Forensic analysis

Herein, an introduction about different forensic samples including criminal and overdosage samples and ecstasy tablets will be presented. Importantly, different methods of the analysis of these samples will be covered including portable approaches.

PB E06 Cancer Biology

This course will cover the different types of carcinogenic agents and how these carcinogenic agents can affect DNA, the mechanism of chemical carcinogenesis, molecular basis of cancer, the mechanisms of activations of proto-oncogenes and their roles in carcinogenesis, the regulators of cell cycle and how the actions of P53 protein and pRb as negative regulators of cell cycle and suppressors of cancer with emphasis of the effects of P53 in stimulating DNA repair and apoptosis. In addition, the tumor markers and their role in diagnosis and evaluation of progression and treatment of cancer will be studied. Biochemical basis of current anticancer treatments will be clarified.

PB E07 Radioisotopes in biochemistry and medicine

This course will cover the types of isotopes, radioactive decay, half-life, measurement and their units. Radioisotope techniques in biochemistry. Research, diagnostic and treatment applications of isotopes will be studied. Biological effects of radiation will be clarified.

PC E04 Drug Design

This course affords advanced aspects of the drug design and discovery. Specifically, it will handle molecular modeling, protein data bank, Pharmacophore building & alignment. QSAR; rational drug design, and combinatorial chemistry.

PC E05 Medicinal chemistry of supplementary drugs and Nutraceuticals

The increasingly emerge of several substances as supplementary drugs and nutraceuticals necessitates that pharmacists should understand the basic knowledge



underlying the therapeutic aspects of the mentioned substances. This elective course will afford pharmacy students with the medicinal chemistry aspects of supplementary drugs; nutraceuticals; Vitamins; Antiaging, and antiobesity agents.

PC E06 Nanochemistry and related aspects

This course focused on the chemical aspects underlying nano- and radiotherapy as main aspects. Related topics involving chemical delivery systems; biotechnology drugs; and Diagnostic agents will be also discussed. The course contents should reflect the basic knowledge concerning the design, analytical and synthetic aspects involved in the development of these new drugs classes.

PG E07 Complementary and Alternative Medicinal Therapies

The study of herbal preparations, nutritional supplements, and homeopathies. The study of herbal preparations that are widely used by the general public as self-selected OTC (over-the-counter) products/NPDs (nonprescription drugs). Food items for therapeutic, disease prevention, or health promotion purposes. Emphasis will be placed on the role of the pharmacist to help clients make an informed choice and counsel them on the selection of useful and safe products.

PG E08 Production and Manufacture of Medicinal Plants

Commercial production of medicinal plants: cultivation, collection, drying, preservation, extraction, quality control, and final packaging of entire or powdered forms or extracts.

PG E09 Poisonous plants

This course will focus on the major poisonous plants that can be harmful to humans, the toxic principle(s) causing the poisoning. These are alkaloids, amino acids, peptides, proteins, thio- and cyanoglycosides, cardinolides, phenolics, acids (oxalic acid), terpenes and resins, diagnosis and treatments for diseases caused by poisonous plants and food poisoning

PI E02 Applied Industrial Pharmacy

The course provides students with the pre-formulation study, quality assurance with emphasis on process validation and sampling techniques, and good manufacturing practice regulations.

PI E03 Good Manufacturing Practice

This course involves the principles of the Current Good Manufacturing Practices (cGMP). It exposes students to all aspects of validation, calibration, inspection and the requirements for manufacturing facilities. It also provides students with a review of the process engineering, technology transfer, personnel management, training and hygiene, premises and contamination control, documentation and auditing, process deviation with emphasis on risk management, complaint handling and product recall theory.

PI E04 Drug Manufacturing

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مقررات Pharm-D clinical

إدارة برنامج الصيدلة الإكلينيكية

The course provides students with the basic understanding in the area of preformulation study, manufacturing of capsules, fundamentals and importance of liposomes, nanoparticles, sterile area, target drug delivery systems, stability, and good laboratory practice.

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**PM E05 Molecular Biology and Epigenetics**

The course aims to provide students with fundamental of molecular biology techniques. It also discusses the molecular mechanisms for regulating gene expression and new techniques used to modulate gene expression. The class will discuss the mechanisms of epigenetic regulation including DNA methylation and posttranslational modification of histones and the roles of chromatin assembly modifying complexes, noncoding RNAs and nuclear organization.

PM E06 Infection Control

This course aims to ensure that students are well prepared to direct the infection control services, to develop and to supervise infection programs in different health care facilities. Also, this course will provide students with knowledge about basic guidelines of infection control, outbreak investigations, surveillance techniques as well as prevention of health care-associated infections. Tthis course will

PM E07 Antimicrobial stewardship

This course provides basic concepts of the emergence and spread of resistance of microorganisms to different antimicrobial drug classes. The specific goal of this course is to provide cutting-edge approaches for detection of resistance and antimicrobial discovery. In addition, chemical optimization, and usage that minimizes the development of resistance will be examined.

PO E07 Biological standardization

This course covers the biological and biochemical evaluation of various drugs that lead identification of the mode of action, safety and hazards of newly developed drugs compared with already available drugs. The first part will cover a brief introduction on biological assay and drug discovering system. The second part is concerned with most recent available analytical techniques used routinely in drugs evaluation in both experimental and clinical labs. The third part covers screening methods and new technologies used for pharmacological evaluation of novel compounds acting on autonomic nervous system, CVS and CNS, endocrine, GIT and respiratory systems.

PP E16 Precision Pharmacy

This course covers all aspects of precision medicine, the basic understanding of genetic disease, molecular diagnostic methods and principles for personalized medicine. The course also investigates the mechanisms for interindividual variability in drug response, ethical, legal and regulatory and issues of pharmacogenetics and best practices to ensure the effectiveness of genomic medicine.

PP E17 Advanced Pharmaceutical Care

The course provides the student with the foundations of pharmaceutical care, principles and skills necessary for patient care process. This course allows students to apply didactic knowledge to direct patient care activities, patient specific pharmacotherapy, evidence based medicine, and effective communication with patients and healthcare professionals

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**PP E18 Radiopharmacy**

The course aims to provide the student with a basic background of nuclear pharmacy and fundamentals of radiopharmacy. The course also focuses on types of radiation, radioisotopes, radionuclide generators and detectors, radiation protection, methods of radiolabeling and design and preparation of radiopharmaceuticals. Diagnostic and therapeutic uses of radiopharmaceuticals and regulatory procedures and quality control of radiopharmaceuticals.

PR E04 Recent techniques of structure elucidation

This course focuses on the identification and structure determination of organic molecules by modern spectroscopic techniques. Problem solving and interpretation of 2D-NMR and mass spectrometry spectra will be emphasized.

PR E05 Green Chemistry

This course focuses on the application of innovative technology to established industrial processes, environmentally improved routes to important products, design of new green chemicals and materials, sustainable resources, biotechnology alternatives, evaluation of environmental impact. Students will understand how to assess the environmental impact of chemical operations and understand the methods for their minimization and be able to suggest alternative green methods to current processes.

PR E06 Advanced Levels of Drug Synthesis

This course presents an integrated and insightful look at successful drug synthesis in the drug discovery market. The course includes an introduction on how chemical synthesis, the art and science of constructing molecules shapes our world. Also, This course includes examples of practical methods to make drugs currently in use or in clinical phases.

PT E09 Cosmetics

This course provides broad-based knowledge about cosmetic products and their types, classification, ingredients, formulation, uses, quality control and packaging.

PT E10 Clinical Pharmaceutics

This course considers the role of basic pharmaceutics in determining or modifying clinical outcomes. It deals with the behavior of medicines within the body and how adverse drug reactions can result from nature of formulation, dosage forms and devices as well as excipients rather than from the drug. It focuses on dealing with formulation/excipient-related problems, tailoring of formulations for specific populations, and how this affects the treatment outcome. The course depends mainly on examples and case studies.

PT E11 Drug Targeting

This course introduces the different technologies that can be employed to enhance the drug accumulation at their target sites. It emphasizes the biological limitations and barriers to drug transport across the membranes, the importance of new excipients and new drug formulations, the possibilities of drug targeting by modern formulation techniques, and how to improve bioavailability of drugs produced by biotechnology.