Courses of Pharmaceutics

I) General Program

A. Credit Hours Program:

PT 111 Pharmacy Orientation

Incompatibilities (Physical, chemical and therapeutic), routes of drug administration; (oral, rectal, topical, parenteral, lung, nasal, ophthalmic, otic and vaginal), Prescription (definition, types; Simple, compound and Narcotic), different type of Pharmaceutical dosage forms, system of medicine, system for weight and measures (the apothecaries', avoirdupois & metric system, conversion of one system to the other), role of the pharmacist in health care team, pharmacy organization, ethics of pharmacy and pharmaceutical terminology (medical terminology, symbols and abbreviations).

History of Pharmacy: Pharmacy among the ancient Egyptians - Pharmacy in the eastern countries - Pharmacy among the Arabs - The most famous Arab medical and pharmacologist scientists - The development of pharmaceutical education in Egypt.

PT 122 Physical Pharmacy

Solubility and solution (types of solutions and colligative properties, solubility of gases in liquids, liquids in liquids, solid in liquids, distribution coefficient and its applications) - rheology of liquids (fundamental of rheology, viscosity & Newtonian and non-Newtonian systems, application of rheology in pharmacy) - surface properties of liquids and solids (fundamentals of surface phenomena and interfacial tension, adsorption and its application in pharmacy and medicine) - stability and reaction kinetics (fundamental degradation pathways and reaction kinetics).

PT 213 Pharmaceutics

Pharmaceutical calculation, pharmaceutical solutions: (definition, types), suspensions: definition, properties, formulation, problems in formulation, suspending agents), emulsions: definition, types, preparation of emulsions, application of emulsions, colloids: types of colloidal systems, stabilization of colloidal systems, properties of colloids.

PT 224 Pharmaceutical Dosage Forms (1)

Solid preparations including tablets (definition, advantages & disadvantages, and types), capsules (definition, advantages & disadvantages, and types (soft and

hard), micro-encapsulation (definition and methods of preparations), suppositories (definition, anatomy and physiology of the rectum, absorption of drugs from the rectum, formulation, manufacture, and quality control).

PT 315 Pharmaceutical Dosage Forms (2)

Semisolid preparations (structure, function & topical treatment of skin. Ointments and creams: (definition, classification, evaluation and uses), cosmetics preparations (anatomy and physiology of the skin, skin-care products, antiperspirants and deodorants, hair - care products, color cosmetics (lip color, face make-up), dentifrices, baby care products), aerosols: theory, mechanisms, applications), equipment, sterile products (parenteral and ophthalmic preparations).

PT 416 Biopharmaceutics and Pharmacokinetics

Concept of Bioavailability (bioavailability and bioequivalence, absolute and relative bioavailability), factors affecting bioavailability, drug absorption, drug distribution, drug metabolism, drug excretion and pharmacokinetic parameters.

PT 427 Industrial Pharmacy (1)

Heat transfer: (introduction, theory, sources, mechanisms, applications and equipment), evaporation: (factors affecting rate of evaporation, equipment), drying: theory of drying, and dryers), crystallization: (theory and factors affecting crystallization and equipment), filtration and centrifugation: (theory of filtration, factors affecting filtration rate and filter aid and equipment).

PT 518 Industrial Pharmacy (2)

Size separation and size reduction: (mechanisms, factors affecting size reduction and equipment), size enlargement: (granulation and equipment), size analysis:(mechanisms, theories, factors affecting size analysis and equipment) mixing: (liquid, solid and semisolid mixing. Mixer selection and equipment), emulsification and homogenization: applications, theory & mechanisms, equipment), good manufacturing practices: (introduction, quality management in the drug industry, quality assurance and good manufacturing practices for pharmaceutical products (GIVIP).

PT 529 Pharmaceutical Business Administration

The pharmacist as entrepreneur, starting or buying pharmacy, legal forms of ownership, selecting location and positioning of pharmacy, the planning process, financing and organizing pharmacy, pharmacy layout and merchandising, accounting, and financial records, purchasing and inventory control, promotion and personal selling, personal relations and patient communication and consultation.

PTE 01 Nano and Radiopharmaceuticals

Introduction to nanotechnology, nano-disperse system including (nano-emulsion and nano-suspension) - preparation and their application - nanoparticles (nanocrystals and polymeric nanoparticles) preparation and their application and nano-metals (silver, gold, carbon, and nanotube).

PTE 02 Cosmetic Preparations

Definition, classification, anti-dandruff preparations, fragrance preparations, nail lacquers, skin care products (emollients and tanning), antiperspirants and deodorants preparations, shampoo, dentifrices preparations, eye, makeup preparations, acne preparations, hair dyes preparations, rouge preparations, lipstick preparations and quality control tests and evaluation of cosmetic preparations.

PP325 Hospital pharmacy

Introduction to hospital pharmacy: (definition and structure of hospital pharmacy, pharmacy – patient relationship, and basic general functions of hospital pharmacy) - the hospital: (definition, classification, hospital functions, objectives of hospital pharmacy) - functional organization of hospital pharmacy: (administrative division, educational and training division, other specific divisions) - surgical dressing and suture materials: (absorbable sutures, synthetic absorbable suture, non-absorbable sutures and metallic sutures) – investigational drugs and hospital committee.

PP 528 Drug Marketing

Introduction of marketing: (pharmaceutical marketing and the commodity marketing) - the product development process in the pharmaceutical marketing, developing a marketing plan, performing a needs analysis, big picture analysis (SWOT analysis) - positioning statement and examples from the industry practices, simple forecasting formula - the budget elements of a product .a communication plan, definition and developing .the marketing research; (definition, objective, types of market research and methods) - recognizing trends; definition, types – recent trends of pharmaceutical marketing, ethical guidelines and regulations - pricing & reimbursement, pricing issue and the contribution of price elements such as discounts, bonuses, credit term - the new trends of pharmacoeconomic studies and role in pricing - the comparison of pricing with the competitors.

UR112 Human Rights

For students taking this course, the aims are:

1- Knowing the different information about human rights in Egypt including the human rights in Islamic law, civil rights, political rights, economic rights, and social rights.
2- Understanding the basic knowledge of pharmaceutical care, patient care and storage of medicine.

PP213 Pharmaceutical Ethics & Legislation

Introducing the law of practicing the profession and registering with the Pharmacists Syndicate. Introducing the schedules of narcotic substances and the rules for their disbursement. Rules for opening pharmaceutical establishments (new pharmacy, drug stores, pharmaceutical factories, and scientific offices). Importing medicines, pharmaceuticals, and medicinal plants. Ethics of the pharmacy profession, the pharmacist-patient relationship, and all kinds of pharmaceutical preparations.

B. Pharma-D Program:

PT 111 Pharmacy Orientation (1+0)

This is a course to acquaint the beginning pharmacy student with the multiple aspects of the profession of pharmacy, including the mission of pharmacy, role of pharmacist in society and pharmacy careers, classification of medications, interpretation of prescriptions and medication orders, general dispensing procedure and factors affecting drug dosage, sources of drugs, different dosage forms and various routes of administration. In addition to the history of pharmacy practice in various civilizations.

PT 122 Physical Pharmacy (2+1)

This course provides students with knowledge of physiochemical principles essential for the design and formulation of pharmaceutical products. Students are introduced to the fundamental concepts of states of matter, Phase equilibrium, colligative properties, isotonicity solubility, dissolution, partition coefficient, surface and interfacial phenomena, surface active agents, adsorption, and its application in pharmacy and rheological behavior of dosage forms.

PT 213 Pharmaceutics I (2+1)

This course is a study of the system of weights, measures, mathematical expertise, and pharmaceutical calculations requisite to the compounding, dispensing, and utilization of drugs in pharmacy practice. It is also concerned with all manufacturing formulations aspects, packaging, storage, and stability of liquid dosage forms including solutions (aqueous and non-aqueous), suspensions, emulsions, and colloids with emphasis on the technology and pharmaceutical rationale fundamental to their design and development. The incompatibilities occurring during dispensing are also considered.

PT 224 Pharmaceutics II (2+1)

This course covers the structure and function of the skin, target area of treatment after topical application to skin, basic principles of diffusion through membranes and factors affecting percutaneous absorption, enhancement of skin penetration,

transdermal drug delivery systems (TDDS). It also describes the principles and techniques involved in the formulation and manufacturing of traditional dermatological semisolid dosage forms (creams, ointments, gels, and pastes) and cosmetic products.

PT 315 Pharmaceutics III (2+1)

The course introduces the students to the kinetics of drug decomposition including rate and order of the reaction, determination of the half-life, expiry date and shelf-life by different methods, stability testing, and in-vitro possible drug/excipients interactions. It also describes the principles and techniques involved in the formulation, and manufacturing of solid dosage forms including powders, granules, tablets, capsules, and suppositories.

PT 326 Biopharmaceutics and Pharmacokinetics (2+1)

This course aims to provide students with an understanding of the relation between the physicochemical properties of the drug and its fate in the body. The course explores the principles of biopharmaceutics and strategies for enhancing drug delivery and bioavailability. Integration of knowledge gained from other courses is emphasized to design and assure the quality of drug products. Students will also be introduced to the principles of pharmacokinetics (absorption, distribution, metabolism, and elimination). The concepts of bioequivalence, biowaivers and in vitro-in vivo correlations (IVIVC's) will be discussed along with different models of drug disposition. The course prepares students for their evolving role in utilizing pharmacokinetics to guide formulation, dosage-regimen design and optimizing drug usage.

PT 327 Pharmaceutics IV (2+1)

This course involves principles of formulation, development, sterilization, packaging, and quality control testing of pharmaceutical sterile drug products. Principles for calculation and manipulation of parenterals, ophthalmic preparations, vaccines and blood products are emphasized. The course also covers the basic
principles of formulation, sterilization, packaging, and applications of radiopharmaceuticals in pharmacy and medicine. An in-depth study on the formulation, manufacturing, quality control testing and applications of aerosols and other inhalation products is also accentuated.

PT 418 Pharmaceutical Technology I (2+1)

The course provides students with an introduction to industrial pharmacy. It deals with the principles of various unit operations such as heat transfer, evaporation, drying, distillation, filtration, centrifugation, crystallization, and extraction. It focuses on the application of these unit operations in pharmaceutical industry with emphasis on the equipment and machines used during the production of different dosage forms.

PT 429 Pharmaceutical Technology II (2+1)

This course is a continuation of the study of the various unit operations in pharmaceutical industry with emphasis on size reduction, size separation, size analysis and size enlargement involved in the process development, scale-up and manufacturing of pharmaceutical drug products in industry (conventional / advanced nanotechnology based). In addition to the container/closure systems, some of the packaging processing methods are covered. Moreover, the vision about designing a quality product and its manufacturing process to consistently deliver the intended performance of the product to meet patient needs is discussed by applying Quality-by-Design principles.

PT 511 Good Manufacturing Practice (1+1)

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.

PT 5211 Advanced Drug Delivery Systems (1+1)

The course aims to provide students with insights and competencies related to the principles of pharmaceutical pre-formulation as a gateway to dosage forms design and formulation. Emphasis is placed on developing formulations based on the physical and chemical properties of the drug substance and the intended use of the drug product. The course also introduces the students to the formulation principles and applications of novel and targeted drug delivery systems by transforming proteins, genes, and other biotechnology driven compounds into therapeutic products. In addition to formulation aspects of biotechnology derived pharmaceuticals, it also covers the application of polymers and excipients to solve problems/issues concerning the optimization of absorption, selective transport, and targeting.

PTE 013 Nano & Radiopharmaceuticals (1+1)

Introduction to nanotechnology, nano-disperse system including (nano-emulsion and nano-suspension) - preparation and their application - nanoparticles (nanocrystals and polymeric nano-particles) preparation and their application and nano-metals (silver, gold, carbon and nano-tube).

PTE 014 Cosmetic Preparations (1+1)

Definition, classification, anti-dandruff preparations, fragrance preparations, nail lacquers, skin care products (emollients and tanning), antiperspirants and deodorants preparations, shampoo, dentifrices preparations, eye, make-up preparations, acne preparations, hair dyes preparations, rouge preparations, lipstick preparations and quality control tests and evaluation of cosmetic preparations.

UR 112 Human Rights and Corruption Fighting (1+0)

This course covers the following topics: human rights in criminal law, the human right to change his nationality or relinquish one of his nationalities, international conventions related to the protection of human rights, the relationship of globalization and development with economic, social, and cultural rights, economic and cultural rights for humans, human rights in Islamic law, Women rights in labor and social security laws, human rights in litigation, civil and political rights of man.