

Pharmaceutics and Industrial Pharmacy department:

Credit hour system

- **Vision :**

Department of Pharmaceutics and Industrial Pharmacy Looked to excellence and keep up with the development with regard to the examination of modern pharmaceuticals and scientific research also seeks to link the academic study, scientific research and practical applications in the pharmaceutical industry to contribute in development of that vital area.

- **Mission:**

Use different educational styles to prepare pharmacists have the basic skills to formulate and preparation and evaluation of different dosage forms and have the ability to work in the pharmaceutical industry and various pharmaceutical fields also adopts the research plan section themed variety keep pace with global research in this area

- **The department teaches the following courses:**

| Course Code | Course Name |
|--------------------|--------------------------------------|
| PHT101 | Introduction to Pharmacy |
| PHT102 | Physical Pharmacy |
| PHT103 | Pharmacy Ethics |
| PHT204 | Pharmaceutics (1) |
| PHT205 | Pharmaceutics (2) |
| PHT306 | Pharmaceutics (3) |
| PHT307 | Biopharmaceutics & Pharmacokinetics |
| PHT308 | Pharmaceutics (4) |
| PHT309 | Pharmacy Legislation |
| PHT410 | Industrial Pharmacy (1) |
| PHT411 | Drug Marketing and Pharmacoeconomics |
| PHT512 | Industrial Pharmacy (2) |
| PHT513 | Cosmetics |
| PHT514 | Pre-formulation and Stability Study |
| PHT515 | Pharmaceutical Quality Control |

- **The department Supervises teaching the following courses:**

| Course Code | Course Name |
|--------------------|--------------------|
|--------------------|--------------------|

| | |
|--------|-------------------------|
| PHA100 | Pharmacy Administration |
|--------|-------------------------|

| Laboratories of Pharmaceutics and Industrial Pharmacy Department | | | |
|---|----------------|---------------|---------------------------------------|
| Laboratory | Lab no. | Floor | Location |
| Preparation Room | 2001 | Ground | Saad Zaghloul Building |
| Pilot Formulation Unit | 2008 | | |
| 1 | 2002 | | |
| 2 | 2003 | | |
| 3 | 2004 | | |
| 4 | 2005 | | |
| 5 | 2007 | | |
| 6 | 2214 | Second | Al-Shahid Ahmed Hamdy Building |
| 7 | 2215 | | |
| 8 | 1004 | Ground | |

- **Course description:**

Level 1, Fall Semester (1):

| Code | PHT101 | Credit hours | | |
|----------------------|---------------------------------|---------------------|--------------|--------------|
| Title | Introduction to Pharmacy | L* | P/T** | Total |
| Pre-requisite | None | 2 | - | 2 |

Course content:

The course covers the following: pharmacy terminology, classification of drug sources, prescription parts, types and handling, pharmaceutical dosage forms, education and pharmacy careers and pharmaceutical organizations. In addition to, an information resources in pharmacy, self-care and self-medication

Level 1, Spring Semester (2):

| Code | PHT102 | Credit hours | | |
|----------------------|--------------------------|---------------------|--------------|--------------|
| Title | Physical Pharmacy | L* | P/T** | Total |
| Pre-requisite | None | 2 | 1 | 3 |

Course content:

The course covers the following: interfacial phenomena: (surface and interfacial tension), spreading coefficient, surfactants types, properties, uses and HLB calculations, solid interface and adsorption isotherm and colligative properties. In addition to, solubility and type of solvents, buffer capacity and its application in pharmacy, viscosity and rheology types, measurement and application, colloidal dispersion, types of colloidal systems, properties and application.

| Code | PHT103 | Credit hours | | |
|----------------------|------------------------|---------------------|--------------|--------------|
| Title | Pharmacy Ethics | L* | P/T** | Total |
| Pre-requisite | None | 1 | - | 1 |

Course content:

The aim of the course is to recognize the code of ethics for the pharmacist, the rules of FIP statement of professional standards, the professional categories of pharmacists (community or retail pharmacist, industrial, academic, hospital and pharmacist in government services) . Also the content includes ethics of OTC drugs, the difference between prescription drugs and OTC drugs, how OTC drugs are approved, how to use OTC drugs safely and who determines when a prescription medicine should be switched to an OTC status.

Level 2, Fall Semester (3):

| Code | PHT204 | Credit hours | | |
|----------------------|--|---------------------|--------------|--------------|
| Title | Pharmaceutics (1) | L* | P/T** | Total |
| Pre-requisite | Physical Pharmacy, Introduction to pharmacy | 2 | 1 | 3 |

Course content:**A) Pharmaceutical solutions:**

- Definition and classification of pharmaceutical solutions.
- Types of water.
- Preparation of purified water and aromatic water.
- Types and preparation of aqueous solutions, e.g: enemas, gargles, mouthwashes, nasal solutions, sprays, otic solution, syrups, mucilages.
- Types and preparation of non-aqueous solutions, e.g: elixirs, spirits, collodions, glycerides, liniments, oleo vitamins

B) Pharmaceutical suspensions:

- Properties and advantages of good suspension.
- Factors affecting sedimentation and suspension additives.
- Discuss stocks law.
- Methods for preparation of pharmaceutical suspensions and assessment of stability for suspension.

C) Pharmaceutical emulsions:

- Definition different types of emulsion.
- Properties and advantages of emulsion.
- Method of preparation, evaluation and stability of emulsion.

Level 2, Spring Semester (4):

| Code | PHT205 | Credit hours | | |
|---------------|--|--------------|-------|-------|
| Title | Pharmaceutics (2) | L* | P/T** | Total |
| Pre-requisite | Physical Pharmacy, Introduction to pharmacy | 2 | 1 | 3 |

Course content:

This course covers the following: introduction to topical formulations, structure of human skin, topical dosage forms including, ointments, pastes, poultices, creams, and gels/jellies. In addition to, percutaneous absorption, transdermal delivery systems and evaluations of semisolids. Also gives aerosols advantages and disadvantages, types, components and filling operations.

Level 3, Fall Semester (5):

| Code | PHT306 | Credit hours | | |
|----------------------|--|---------------------|--------------|--------------|
| Title | Pharmaceutics (3) | L* | P/T** | Total |
| Pre-requisite | Physical Pharmacy, Introduction to pharmacy | 2 | 1 | 3 |

Course content:

The course covers the following: Powders, particle size and their analysis, micromeritics, angle of repose, porosity, void, and bulk volume, particle size reduction, blending powders, medicated powders, bulk and divided powders, granules and effervescent granulated salts. In addition to an overview of capsules, hard gelatin capsules, capsule sizes, preparation, filling, developing the formulation, capsule sealing, cleaning and polishing capsules, soft gelatin capsules, their use, preparation and containers for dispensing capsules. The course comprises also tablets types, excipients, wet granulation, dry granulation, direct compression tableting and tablet coating, suppositories and pessaries, their types and methods of preparation, other solid dosage forms for oral administration and novel drug delivery systems.

| Code | PHT307 | Credit hours | | |
|----------------------|--|---------------------|--------------|--------------|
| Title | Biopharmaceutics & Pharmacokinetics | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1) | 2 | 1 | 3 |

Course content:

The course gives a general introduction to pharmacokinetics, rates and order of reactions. One compartment intravenous bolus. Two compartment body model and volume distribution terms. Clearance, elimination rate constant (k_e), calculation using rate of excretion data and amount remaining to be excreted (ARE) data. Factors affecting validity of urine data. Drugs and route of administration. Transport across cell membranes. Absorption and factors affecting drug absorption. Drug distribution and protein binding. Drug elimination.

Level 3, Spring Semester (6):

| Code | PHT308 | Credit hours | | |
|---------------|--|--------------|-------|-------|
| Title | Pharmaceutics (4) | L* | P/T** | Total |
| Pre-requisite | Physical Pharmacy, Introduction to Pharmacy, Pharmaceutical Microbiology | 2 | - | 2 |

Course content:

This course comprises sterile dosage forms, parenteral products, ophthalmic and nasal products, adjustment of isotonicity, calculations and applications of isotonic buffer, milliequivalent, millimole and milliosmole. In addition to, radio pharmacy and radiopharmaceuticals and extended release of pharmaceutical preparations.

| Code | PHT309 | Credit hours | | |
|---------------|----------------------|--------------|-------|-------|
| Title | Pharmacy Legislation | L* | P/T** | Total |
| Pre-requisite | None | 1 | - | 1 |

Course content:

لائحة تقاليد المهنة، تنظيم العلاقة بين الصيدالة وأعضاء المهن الطبية الأخرى، قانون مزاولة مهنة الصيدلة، المؤسسات الصيدلانية، شروط الترخيص للمؤسسات الصيدلانية، المستحضرات الصيدلانية الخاصة والدستورية، اللوائح والجدول المنظمة لتداول الجواهر المخدرة، الإشتراطات الصحية والفنية الواجب توافرها في مصانع الأدوية.

Level 4, Fall Semester (8):

| Code | PHT410 | Credit hours | | |
|---------------|-------------------------|--------------|-------|-------|
| Title | Industrial Pharmacy (1) | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (3) | 2 | 1 | 3 |

Course content:

This course focuses on origins of pharmaceutical industry, laboratory safety, factory areas and layout. In addition to tableting principles, mixing, granulation, drying and size reduction equipment, process control and validation, tablet compression and tablet press operation, production and coating systems of tablet and finally capsule filling system and soft gelatin capsule.

| Code | PHA100 | Credit hours | | |
|---------------|--|--------------|-------|-------|
| Title | Pharmacy Administration (University requirement) | L* | P/T** | Total |
| Pre-requisite | Introduction to Pharmacy, Pharmacy Ethics | 2 | – | 2 |

Course content:

الإدارة، طبيعتها ومفهومها، الإدارة والمفاهيم المستحدثة، مجالات الإدارة، وظائف الإدارة. توجيهات المدير، المفاهيم الإدارية، دراسة لبعض المفاهيم. دور المدير في تحقيق التكامل بين وظائفه كمدير وبعض المواقف الإدارية. إدارة حركة الأموال الشراء وتسويق الصيدلية.

| Code | PHT411 | Credit hours | | |
|---------------|---|--------------|-------|-------|
| Title | Drug Marketing and Pharmacoeconomics | L* | P/T** | Total |
| Pre-requisite | Introduction to Pharmacy, Pharmacy Ethics | 2 | – | 2 |

Course content:

This course deals with marketing concept, specification of pharmaceutical marketing, market segmentation, relation between research and development and marketing, implementation of marketing strategy and pharmacoeconomics principles.

Level 5, Fall Semester (9):

| | | | | |
|----------------------|--------------------------------|---------------------|--------------|--------------|
| Code | PHT512 | Credit hours | | |
| Title | Industrial Pharmacy (2) | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2,4) | 2 | 1 | 3 |

Course content:

This course focuses on design of a sterile and aseptic manufacturing facility, sterilization process and sterile product in industry, different types of water for pharmaceutical proposes, WHO regulations for sterile products and facility setting and materials selected for pharmaceutical packaging. In addition to filtration, sterile filtration, sterile product packaging, centrifugation, heat transfer, evaporation and mixing and GMP and process validation.

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|----------------------|-----------------------|---------------------|--------------|--------------|
| Code | PHT513 | Credit hours | | |
| Title | Cosmetics | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2,3) | 2 | 1 | 3 |

Course content:

This course comprises introduction, structure of the skin, UV radiation, cleansing creams, lotions, emollients and moisturizers. Sunscreen, sun-tan and sun-burn products. In addition to facial masks and scrubs, vanishing and foundation products, shaving products, lipsticks, shampoos, hair tonics, conditioners, antiperspirants and deodorants.

Level 5, Spring Semester (10):

| Code | PHT514 | Credit hours | | |
|---------------|------------------------------------|--------------|-------|-------|
| Title | Preformulation and Stability Study | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2,3,4) | 2 | 1 | 3 |

Course content:

This course comprises a general introduction, preformulation study for new drugs entities or new formulations including organoleptic properties, purity, physical properties, crystal properties, solubility and dissolution, hygroscopicity, partition coefficient, powder flow, cohesiveness, compressibility and compatibility study. And also reactions affecting stability of drugs, reactions kinetics, accelerated stability tests and determination of expiration date.

| Code | PHT515 | Credit hours | | |
|---------------|--------------------------------|--------------|-------|-------|
| Title | Pharmaceutical Quality Control | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2,3,4) | 2 | 1 | 3 |

Course content:

This course focuses on QC, QA and GMP of pharmaceutical products. TQM and ISO 9000, GCLP and validation, quality audit, inspection of pharmaceutical drug companies and self-inspection. In addition to validation: case study and checklists and current good manufacturing practice (cGMP).

- **Elective Courses:**

| Code | PHT600 | Credit hours | | |
|----------------------|------------------------------------|---------------------|--------------|--------------|
| Title | Novel Drug Delivery systems | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2,3) | 2 | 1 | 3 |

Course content:

This course covers the following: Drug delivery systems: a revolution in dosage form design and development, hot-melt extrusion (HME), nanotechnology in drug delivery, lipid nanoparticulate, niosomes as carrier in dermal drug delivery. Oral delivery of insulin: novel approaches. Novel mucoadhesive polymers for nasal drug delivery. Liposomes and drug delivery. Biodegradable nanoparticles. Aerosol drug delivery. Oil-in-water nanosized emulsions, medical applications. Transdermal drug delivery. Gene delivery systems.

| Code | PHT601 | Credit hours | | |
|----------------------|-----------------------------------|---------------------|--------------|--------------|
| Title | Cosmetic and Cosmoceutical | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2) | 2 | 1 | 3 |

Course content:

This course includes makeup cosmetics, fragrance products, oral care cosmetics, whitening agents, hair growth promoters, skin-care agents, anti-acne agents, antiperspirants and deodorants.

| Code | PHT602 | Credit hours | | |
|----------------------|--|---------------------|--------------|--------------|
| Title | Advanced Manufacturing and Evaluation of Dosage Forms | L* | P/T** | Total |
| Pre-requisite | Pharmaceutics (1,2,3) | 2 | 1 | 3 |

Course content:

From pilot plant to manufacturing: effect of scale-up on operation. Controlled-release dosage forms manufacturing. Nanotechnology in pharmaceutical manufacturing, characterization, and safety. Radiopharmaceutical manufacturing. Biotechnology-derived drug product development.

| Code | PHT603 | Credit hours | | |
|----------------------|---|---------------------|--------------|--------------|
| Title | Pharmaceutical Pharmacy practice | L* | P/T** | Total |
| Pre-requisite | Introduction to Pharmacy | 2 | 1 | 3 |

Course content:

Continuing professional development (CPD). Focus on new pharmacist career opportunity. Dispensing prescriptions. Pharmaceutical care plans. Computer management in pharmacy. Good pharmacy practice and evidence-based care. Communication and Presentation skills improvement. Extemporaneous Pharmaceutical preparations and medical products. Proper storage conditions in pharmacy. Para-pharmaceuticals.