

Alayen University
College of Pharmacy
Department of Pharmaceutics

Title of the course: *Biopharmaceutics* Course number: **414**

Level: 4th Class, 1st Semester

Credit hours/week : **Theory 2 Laboratory 1**

- Reference text: *Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.*

Objectives: The course deals with the physical and chemical properties of drug substance, dosage form and the biological effectiveness of the drug or drug product upon administration, including drug availability in the human or animal body from a given dosage form. The pharmacokinetic part of the course deals with the time-course of the drug in the biological system, and quantification of drug concentration pattern in normal subjects and in certain disease states.

| No | Lecture title | hours |
|----|---|-------|
| 1 | Introduction to biopharmaceutics. | 2 |
| 2 | Biopharmaceutic aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type of dosage forms. | 6 |
| 3 | One compartment open model. | 2 |
| 4 | Multicompartment models. | 2 |
| 5 | Pharmacokinetics of drug absorption. | 2 |
| 6 | Bioavailability and bioequivalence. | 2 |
| 7 | Clearance of drugs from the biological systems. | 2 |
| 8 | Hepatic elimination of drugs. | 2 |
| 9 | Protein binding of drugs. | 2 |
| 10 | Intravenous infusion | 2 |

| | | |
|----|--------------------------------------|---|
| 11 | Multiple dosage regimens. | 2 |
| 12 | Non-linear pharmacokinetics. | 2 |
| 13 | Dosage adjustment in renal diseases. | 2 |

Alayen University

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Organic Pharmaceutical Chemistry II* Course number: **412**

Level: 4th Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (Eds.); 10th ed., 2004.*

Objectives : The course is devoted to the discovery and development of new agents for treating diseases, and enables translating the drug structural formula into therapeutic effect. Additionally, it focuses on the methods of preparation for some pharmaceutical agents

| No | Lecture title |
|----|---|
| 1 | Cholinergic agents, cholinergic receptors and their subtypes. |
| 2 | Cholinergic agonists; stereochemistry and structure-activity relationships (SAR); products; cholinesterase inhibitors. |
| 3 | Cholinergic blocking agent; structure-activity relationships (SAR); Solanaceous alkaloid and analogues; synthetic cholinergic blocking agents and products; ganglionic blocking agents (neuromuscular blocking agents). |
| 4 | Analgesic agents (SAR of morphine, SAR of meperidine type molecules; SAR of methadone type compounds; N-methylbezomorphans, antagonist type analgesics in benzomorphans). |
| 5 | Analgesic receptors, endogenous opioids; Products; Antitusive agents; Anti-inflammatory analgesics. |
| 6 | Adrenergic agents (Adrenergic neurotransmitters); Adrenergic receptors; Drugs affecting Adrenergic neurotransmission; Sympathomimetic agents; Adrenergic receptor antagonists. |
| 7 | CNS depressant; Benzodiazepines and related compounds; Barbiturates; CNS depressant with skeletal muscle relaxant properties; Antipsycotics; Anticonvulsants. |
| 8 | CNS Stimulants |
| 9 | Steroidal & nonsteroidal hormones |

| hours |
|-------|
| 3 |
| 5 |
| 5 |
| 5 |
| 5 |
| 5 |
| 8 |
| 7 |
| 3 |
| 4 |

Alayen University

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course:Public Health Course number: **415**

Level: 4th Class, 1st Semester

Credit hours/week : **Theory 2**

Reference text: *Lucas AO, Gilles HM, (Eds), Short Textbook of Public Health Medicine for the Tropic, (4th Ed), 2003.*

Objectives: This course enables the students to understand the principles of public health and the art of preventing disease, promoting health and prolonging life, through organized effort of society.

| No | Lecture title | hours |
|----|---|-------|
| 1 | General items &ICD10 | 2 |
| 2 | Predisposing factors of infectious diseases | 1 |
| 3 | Cardiovascular diseases | 1 |
| 4 | Gastrointestinal diseases | 2 |
| 5 | Skin diseases | 1 |
| 6 | -Sexually transmitted diseases | 1 |
| 7 | Oncogenic diseases | 3 |
| 8 | Respiratory infections | 2 |
| 9 | Familyplaninig include maternal infections, vaccination | 2 |
| | -Immunology | |
| 10 | General introduction | 1 |
| 11 | innate &adaptive immunity | 2 |
| 12 | -antigen characteristics | 1 |
| 13 | B&Tcells | 2 |
| 14 | complements | 1 |
| 15 | Hypersensitivity types | 2 |
| 16 | Oncogenic immunity | 3 |
| 17 | -Auto immune diseases | 2 |
| 18 | Immune deficiency diseases | 1 |

Alayen University
College of Pharmacy
Department of Clinical Pharmacy

Title of the course: **Clinical Pharmacy I**

Level: 4th Class, 1st Semester

Credit hours/week : Theory 2 lab:- 1

Reference Text: ALISON BLENKINSOPP, PAUL PAXTON(eds), Symptoms in the Pharmacy. A Guide to the Management of Common Illness, 6th edition.

Lor waterfield, Community Pharmacy Hand Book, 5th edition

| No | Lecture title |
|----|--|
| 1 | Introduction to community pharmacy. |
| 2 | Respiratory problems: Cough, Common cold, allergic rhinitis, Otitis media, Laryngitis & Pharyngitis |
| 3 | G.I.T problemse: Diarrhea, Constipation, Heart burn and indigestion, IBS and Hemorrhoids |
| 4 | Pediatic care practice : Oral thrush, pinworms and head lice |
| 5 | Skin conditions: Acne, Scabies, Psoriasis, Hair loss, Fungal infection, Eczema and Dermatitis , Dandruff, Cold sore, Corns and Callus. 5 |
| 6 | women s health care: Cystitis and vaginal thrush, primary dysmenorrhea and Premenstrual syndrome. |
| 7 | CNS related problems: Headache, Insomnia, Motion sickness, Nausea and vomiting |
| 8 | - Eye problems |
| 9 | ENT problems |
| 10 | Oral hygiene, mouth ulcer |
| 11 | Obesity and body weight control. |
| 12 | - Pain and musculoskeletal disorders |
| 13 | Nicotine replacement therapy (NRT). |
| 14 | Dietary supplements |
| 15 | An update in reclassification of OTC drugs (simvastatin, Tamusotisin & azithromycin). |
| 16 | Medication adherence and errors. |

| hours |
|-------|
| 1 |
| 3 |
| 4 |
| 2 |
| 5 |
| 2 |
| 3 |
| 1 |
| 1 |
| 1 |
| 1 |
| 1 |
| 1 |
| 1 |
| 1 |
| 2 |
| 1 |

Alayen University

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: **Pharmacology II** Course number: **411**

Level: 4th Class, 1st Semester

Credit hours/week: **Theory 3 Laboratory 1**

Reference text: *Lipincott Pharmacology 3rd Edition, 2006*

Objectives: To introduce the pharmacy students to the general pharmacology of the central nervous system and to the various drug groups used in the treatment of CNS diseases or drugs altering its function. The student will be introduced to the various drugs used in the management of cardiovascular diseases. Moreover the course will cover the drugs affecting the gastrointestinal and respiratory systems.

| No | Lecture title |
|----|--|
| 1 | Introduction to CNS pharmacology. |
| 2 | CNS stimulants. |
| 3 | Anxiolytic and Hypnotic drugs. |
| 4 | General and Local Anesthetics. |
| 5 | Antidepressant drugs. |
| 6 | Antipsychotic (neuroleptic) drugs. |
| 7 | Opioid analgesics and antagonists. |
| 8 | Treatment of neurodegenerative diseases. |
| 9 | Antiepileptic Drugs. |
| 10 | Diuretics. |
| 11 | The treatment of heart failure (HF). |
| 12 | Antiarrhythmic drugs. |
| 13 | Antianginal Drugs. |
| 14 | Antihypertensive drugs. |
| 15 | Drugs affecting the blood. |

| | |
|----|---|
| 16 | Antihyperlipidemic drugs. |
| 17 | Gastrointestinal and antiemetic drugs. |
| 18 | Drugs acting on the respiratory system. |

| hours |
|-------|
| 2 |
| 2 |
| 3 |
| 3 |
| 3 |
| 2 |
| 3 |
| 3 |
| 2 |
| 2 |
| 2 |
| 2 |
| 2 |
| 3 |
| 3 |

| |
|---|
| 2 |
| 2 |
| 3 |

Alayen University

College of Pharmacy

Department of Clinical Pharmacy

Title of the course: **Clinical Pharmacy II**

Level: 4th Class, 2nd Semester

Credit

hours/week : Theory 2 hours Lab 1

Reference Text: Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics

| No | Lecture title |
|----|--|
| 1 | Introduction to the concept of clinical pharmacy- its activities and professional responsibilities.(including current state of clinical pharmacy in Iraq) . |
| 2 | an overview of pharmaceutical care practice (the patient care process). |
| 3 | Hematologic disorders: Anemia and sickle cell disease. |
| 4 | Hypertension. |
| 5 | Ischemic heart diseases |
| 6 | Heart failure. |
| 7 | Peripheral vascular diseases. |
| 8 | - Asthma. |
| 9 | Chronic obstructive pulmonary disease (COPD). |
| 10 | Diabetes mellitus & Diabetic ketoacidosis (DKA) . |
| 11 | Peptic ulcer disease. |
| 12 | Tuberculosis |
| 13 | Infective meningitis |
| 14 | Respiratory tract infections |
| 15 | GIT infections |
| 16 | Gout and hyperuricemia |
| 17 | Rheumatoid arthritis (RA) and osteoarthritis (OA) |
| 18 | Osteoporosis and other metabolic bone disease. |
| 19 | Infectious Endocarditis |
| 20 | Surgical antibiotic prophylaxis |
| 21 | Urinary tract infection (UTI) |

| hours |
|-------|
| 1 |
| 1 |
| 2 |
| 2 |
| 2 |
| 2 |
| 1 |
| 2 |
| 1 |
| 2 |
| 2 |
| 1 |
| 1 |
| 2 |
| 1 |
| 1 |
| 2 |
| 1 |
| 1 |
| 1 |
| 1 |

Alayen University

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: **General Toxicology** Course number: **429**

Level: 4th Class, 2nd Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: **Casarett and Doull, Toxicology, the Basic Science of Poisons; latest edition.**

Objectives: To study the principle of exposure to different chemicals and environmental factors, their sources, mechanisms of toxicity and their risk to human being; it enables students to understand the required measures to protect living organisms against the suspected toxic hazards.

| No | Lecture title |
|----|--|
| 1 | Introduction: general consideration; host factor, environmental factors of toxic effects. |
| 2 | Carcinogenesis. |
| 3 | Mutagenesis: |
| 4 | Target organs and systemic toxicology; Respiratory system, Liver, Kidney, Skin, Nervous system, cardiovascular system, Blood. |
| 5 | Toxic substances: Food additive and contaminants, Pesticides, Metals, Radiation and radio active materials, plants, Solvents, |
| 6 | Environmental toxicology: Air pollution, water and soil pollutants, Gases (Tear gas, Pepper spray), CO, Cyanide(H ₂ S). |

| hours |
|--------------|
| 3 |
| 3 |
| 1 |
| 16 |
| 15 |
| 7 |
| |

Alayen University

College of Pharmacy

Department of Pharmaceutics

Title of the course: **Industrial Pharmacy I** Course number: **4210**

Level: 4th Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: ***The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.***

Objectives: The subject aim to teach pharmacy students the steps and lines upon which the preformulation processing of pharmaceutical dosage forms. This fundamental course provide the required principles to integrate knowledge of Pharmaceutical Technology in preformulation of perfect dosage form. It includes milling, mixing, drying and filtration, besides sterilization to achieve a proper processing of dosage forms.

| No | Lecture title |
|----|---|
| 1 | Principles of pharmaceutical processing; mixing; fluid mixing; flow characteristics; mechanisms of mixing; mixing equipments; batch and continuous mixing; mixer selection; solid mixing theory and particulate solid variables; forces and mechanisms. |
| 2 | Milling; pharmaceutical application; size measurement methods; theory and energy of comminution; types of mills; factors influencing milling; selection of mill techniques; specialized drying methods. |
| 3 | Drying: definition; purpose; humidity measurement; theory of drying; drying of solids, and classification of dryer; specialized drying methods. |
| 4 | Clarification and filtration: Theory; filter media; filter aids; selection of drying method; non-sterile and sterile operations; integrity testing; equipments and systems (commercial and laboratory). |
| 5 | Sterilization; validation of methods; microbial death kinetics; methods of sterilization (thermal and non-thermal); mechanisms; evaluation. |
| 6 | Pharmaceutical dosage form design; pre-formulation; preliminary evaluation; bulk characterization; solubility and stability analysis. |
| 7 | Pharmaceutical dosage forms; sterile products; development; formulation; production; processing; quality control. |

| hours |
|-------|
| 7 |
| 7 |
| 7 |
| 7 |
| 7 |
| 3 |
| 7 |
| |

Alayen University

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Organic Pharmaceutical Chemistry III* Course number: **427**

Level: 4th Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (Eds.); 10th ed., 2004.*

Objectives: To enable understanding mechanisms of drug action, including antibacterial, antifungal and antiviral agents, at molecular level, and the role of medicinal chemistry in the discovery and development of synthetic therapeutic agents. It also enables students to understand the concept of structure-activity relationship and its application in design and synthesis of new chemotherapeutic agents and hormone derivatives with potential biological activity.

| No | Lecture title |
|----|---|
| 1 | β -Lactam antibiotics (Penicillins); β -Lactamase inhibitors; Cephalosporins and Monobactams. |
| 2 | Aminoglycosides and Chloramphenicol; Tetracyclines; Macrolides; Lincomycins and Polypeptides; Antiviral agents (properties of viruses, viral classification, products). |
| 3 | Sulfonamides (chemistry, nomenclature, mechanism of action, resistance, toxicity, side effects, metabolism, protein binding, distribution and SAR); products; Sulfones. |
| 4 | Anti-neoplastic agents: Alkylating agents; Antimetabolites; Antibiotics; Plant products; Miscellaneous compounds. |
| 5 | Hormones and related compounds; Future anti-neoplastic agents; Monoclonal antibodies; Gene therapy of cancer. |
| | |

| |
|--------------|
| hours |
| hours |
| 9 |
| 9 |
| 4 |
| 17 |
| 6 |
| |
| |

Alayen University

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: **Pharmacology III** Course number: **426**

Level: 4rd Class, 2nd Semester

Credit hours/week: **Theory 2 hours**

Reference text: **Lipincott Pharmacology 3rd Edition, 2006**

Objectives: To introduce the pharmacy students to various drug groups affecting endocrine systems and their use in correcting abnormalities in the endocrine functions.

Moreover the course will cover the drugs used in the management of neoplastic diseases, bone disorders, obesity and erectile dysfunction. Inflammatory agents and the anti-inflammatory drugs will also be covered during this course.

| No | Lecture title |
|----|--|
| 1 | Hormones of the pituitary and thyroid glands. |
| 2 | Insulin and oral hypoglycemic drugs. |
| 3 | Adreno-corticosteroids. |
| 4 | The gonadal hormones and inhibitors. |
| 5 | Autacoids and autacoid antagonists |
| 6 | Non-steroidal anti-inflammatory drugs (NSAIDs) and other anti-inflammatory agents. |
| 7 | Drugs used in erectile dysfunction. |
| 8 | Drugs used in osteoporosis. |
| 9 | Drugs used in the management of obesity. |
| 10 | Cancer Chemotherapy: Anticancer drugs and immunosuppressants. |

| hours |
|-------|
| 3 |
| 4 |
| 3 |
| 3 |
| 3 |
| 3 |
| 2 |
| 2 |
| 2 |
| 5 |