



وصف المقرر الدراسي

قسم الصيدلة

المرحلة الرابعة

Title of the course: **Biopharmaceutics**

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

**Theory**

No.	Lecture title
١.	Introduction to biopharmaceutics
٢.	Biopharmaceutic aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type of dosage forms
٣.	One compartment open model
٤.	Multicompartment models
٥.	Pharmacokinetics of drug absorption
٦.	Bioavailability and bioequivalence
٧.	Clearance of drugs from the biological systems
٨.	Hepatic elimination of drugs
٩.	Protein binding of drugs
١٠.	Intravenous infusion
١١.	Multiple dosage regimens
١٢.	Non-linear pharmacokinetics

١٣	Dosage adjustment in renal diseases
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Title of the course: ***Practical of Biopharmaceutics***

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

No.	Lab. title
١.	Preparation of calibration curve of salicylic acid
٢.	<i>In vitro</i> evaluation of bulk laxative
٣.	<i>In vitro</i> evaluation of antacids
٤.	Dissolution of tablets
٥.	Review and tutorial
٦.	Determination of pharmacokinetic parameters from CP-time by residual method
٧.	Determination of pharmacokinetic parameters from CP-time by trapezoidal method
٨.	Determination of pharmacokinetic parameters from urine excretion samples
٩.	Hydrolysis of aspirin in buffer pH ٦,٨
١٠.	Review and tutorial

Title of the course: ***Clinical pharmacy - I***

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

### Theory

No.	Lecture title
١.	Introduction to community pharmacy

٢.	<b>Respiratory problems: Cough, Common cold, allergic rhinitis, Otitis media, Laryngitis and Pharyngitis</b>
٣.	<b>G.I.T problems: Diarrhea, Constipation, Heart burn and indigestion, IBS and Hemorrhoids</b>
٤.	<b>Pediatric care practice : Oral thrush, pinworms and head lice</b>
٥.	<b>Skin conditions: Acne, Scabies, Psoriasis, Hair loss, Fungal infection, Eczema and Dermatitis, Dandruff, Cold sore, Corns and Callus</b>
٦.	<b>Women's' health care: Cystitis and vaginal thrush, primary dysmenorrhea and Premenstrual syndrome</b>
٧.	<b>CNS related problems: Headache, Insomnia, Motion sickness, Nausea and vomiting</b>
٨.	<b>- Eye problems</b>
٩.	<b>ENT problems</b>
١٠.	<b>Oral hygiene, mouth ulcer</b>
١١.	<b>Obesity and body weight control</b>
١٢.	<b>- Pain and musculoskeletal disorders</b>
١٣	<b>Nicotine replacement therapy ( NRT)</b>
١٤	<b>Dietary supplements</b>
١٥.	<b>An update in reclassification of OTC drugs ( simvastatin, Tamusotisin &amp; azithromycin)</b>
١٦.	<b>Medication adherence and errors</b>

Title of the course: ***Practical of Clinical pharmacy - I***

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

No.	Practice Title
١	Communication with patients.

٢	Respiratory system in practice (part I): Cough.
٣	Respiratory system in practice (part II): Common cold.
٤	G.I.T system in practice (part I): Constipation.
٥	G.I.T system in practice (part II): Diarrhea and IBS.
٦	GIT system in practice (part III): GERD& indigestion.
٧	Skin conditions in practice (part I): Hair loss; cold sore and athlete's foot.
٨	Skin conditions in practice (part II): Dandruff, Eczema and mouth ulcer.
٩	Skin conditions in practice (part III): warts and scabies.
١٠	Pediatrics in practice: Oral thrush; colic; pinworm and napkin rash.
١١	Minor eye disorders in practice.
١٢	CNS system: Insomnia, motion sickness, obesity and nicotine replacement therapy (NRT).
١٣	Drug Information sources for pharmacist.
١٤	An update in reclassification of OTC drugs.
١٥	Collective practice.

Title of the course: ***Organic Pharmaceutical Chemistry - II***  
 Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester  
**Theory**

No.	Lecture title
١.	Cholinergic agents, cholinergic receptors and their subtypes

٢.	<b>Cholinergic agonists; stereochemistry and structure-activity relationships (SAR); products; cholinesterase inhibitors</b>
٣.	<b>Cholinergic blocking agent; structure-activity relationships (SAR); Solanaceous alkaloid and analogues; synthetic cholinergic blocking agents and products; ganglionic blocking agents (neuromuscular blocking agents)</b>
٤.	<b>Analgesic agents (SAR of morphine, SAR of meperidine type molecules; SAR of methadone type compounds; N-methylbezomorphans, antagonist type analgesics in benzomorphans)</b>
٥.	<b>Analgesic receptors, endogenous opioids; Products; Antitusive agents; Anti-inflammatory analgesics</b>
٦.	<b>Adrenergic agents (Adrenergic neurotransmitters); Adrenergic receptors; Drugs affecting Adrenergic neurotransmission; Sympathomimetic agents; Adrenergic receptor antagonists</b>
٧.	<b>CNS depressant; Benzodiazepines and related compounds; Barbiturates; CNS depressant with skeletal muscle relaxant properties; Antipsycotics; Anticonvulsants.</b>
٨.	<b>CNS Stimulants.</b>
٩.	<b>Steroidal &amp; nonsteroidal hormones.</b>

Title of the course:

***Practical of Organic Pharmaceutical Chemistry - II***

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

<b>No.</b>	<b>Lab. Title</b>
١.	<b>Preparation of salicylic acid</b>
٢.	<b>Re-crystallization of salicylic acid</b>
٣.	<b>Synthesis of aspirin</b>
٤.	<b>Re-crystallization of aspirin</b>
٥.	<b>Assay of aspirin (known sample)</b>

٦.	Assay of aspirin (unknown sample)
٧.	Preparation of nitrobenzene
٨.	Preparation of aniline
٩.	Preparation of acetanilide
١٠.	Re-crystallization of acetanilide
١١.	Chlorosulfonation of acetanilide
١٢.	Amination of <i>p</i> -chlorobenzene sulfonyl chloride
١٣.	Hydrolysis of <i>p</i> -chlorobenzene sulfonyl chloride to sulfanilamide
١٤.	Assay of sulfa drugs (known sample)
١٥.	Assay of sulfa drugs (unknown sample)

Title of the course: ***Pharmacology- II***

Level:  $\xi^{\text{th}}$  Class,  $\wedge^{\text{st}}$  Semester

### Theory

No.	Lecture title
١.	Introduction to CNS pharmacology
٢.	CNS stimulants
٣.	Anxiolytic and Hypnotic drugs
٤.	General and Local Anesthetics
٥.	Antidepressant drugs
٦.	Antipsychotic (neuroleptic) drugs
٧.	Opioid analgesics and antagonists
٨.	Treatment of neurodegenerative diseases
٩.	Antiepileptic Drugs
١٠.	Diuretics
١١.	The treatment of heart failure (HF)
١٢.	Antiarrhythmic drugs

١٣.	<b>Antianginal Drugs</b>
١٤.	<b>Antihypertensive drugs</b>
١٥.	<b>Drugs affecting the blood</b>
١٦.	<b>Antihyperlipidemic drugs</b>
١٧.	<b>Gastrointestinal and antiemetic drugs</b>
١٨.	<b>Drugs acting on the respiratory system</b>

Title of the course: ***Practical Pharmacology- II***

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

No.	Lab. title
١.	<b>Routs of drug administration</b>
٢.	<b>Onset and duration of drugs (Barbiturates )</b>
٣.	<b>Absorption and excretion of drugs</b>
٤.	<b>Effect of parasympathomimetics on gland secretions</b>
٥.	<b>Drugs and human eye.</b>
٦.	<b>The effects of drugs on IOP rabbits</b>
٧.	<b>Evaluation of opioid analgesics</b>
٨.	<b>Evaluation of NSAID<sub>s</sub></b>
٩.	<b>Evaluation of anti-parkinsonian drugs</b>
١٠.	<b>Evaluation of anti- convulsant drugs</b>
١١.	<b>The effects of drugs and their antagonists on isolated rats ileum</b>
١٢.	<b>The effects of drugs and their antagonists on isolated rabbits ileum</b>

Title of the course: ***Public Health***

Level: ٤<sup>th</sup> Class, ١<sup>st</sup> Semester

**Theory**

No.	Lecture title

1.	Concepts and principles of public health and preventive medicine
2.	Public health and statistics: Information for health care providers
3.	General items & ICD 10
4.	Communicable diseases: Infections through the gastro-intestinal tract
5.	Infections through skin and mucous membranes
6.	Infections through the respiratory tract
7.	Arthropod-borne infections
8.	Non-communicable disease: Health in transition
9.	Nutritional disorders
10.	Family health, Family planning include maternal infections, vaccination
11.	Sexually transmitted diseases
12.	Historical perspective and development of pharmacy practice
13.	Pharmacy practice and healthcare system.
14.	Community pharmacy practice, management, dispensing and health promotion.
15.	Compliance, adherence and concordance.
16.	Hospital pharmacy services.
17.	Community pharmacy services.

Title of the course: *Communication Skills*

Level: 5<sup>th</sup> Class, 7<sup>nd</sup> Semester

**Theory**

No.	Lecture title
1.	Patient-Centered Communication in Pharmacy Practice
2.	Principles and Elements of Interpersonal Communication
3.	Nonverbal type of communication
4.	Barriers to communication
5.	Listening and empathic responding during communication
6.	Assertiveness
7.	Interviewing and assessment
8.	Helping patients to manage therapeutic regimens



٩.	Patient counseling; counseling check list; point-by-point discussion; counseling scenario
١٠.	Medication safety and communication skills
١١.	Strategies to meet specific needs
١٢.	Communicating with children and elderly about medications
١٣	Communication skills and inter-professional collaboration
١٤	Electronic communication in healthcare
١٥	Ethical behavior when communicating with patients

Title of the course: ***Clinical Pharmacy - II***  
Level: ٤<sup>th</sup> Class, ٧<sup>nd</sup> Semester  
**Theory**

No.	Lecture title
١.	Introduction to the concept of clinical pharmacy- its activities and professional responsibilities.( including current state of clinical pharmacy in Iraq)
٢.	An overview of pharmaceutical care practice (the patient care process)
٣.	Hematologic disorders: Anemia and sickle cell disease
٤.	Hypertension
٥.	Ischemic heart diseases
٦.	Heart failure
٧.	Peripheral vascular diseases
٨.	- Asthma
٩.	Chronic obstructive pulmonary disease (COPD)
١٠.	Diabetes mellitus & Diabetic ketoacidosis (DKA)
١١.	Peptic ulcer disease
١٢.	Tuberculosis
١٣	Infective meningitis
١٤	Respiratory tract infections
١٥.	GIT infections

١٦.	Gout and hyperuricemia
١٧	Rheumatoid arthritis (RA) and osteoarthritis (OA)
١٨	Osteoporosis and other metabolic bone disease
١٩	Infectious Endocarditis
٢٠	Surgical antibiotic prophylaxis
٢١	Urinary tract infection (UTI)

Title of the course: *Practical of Clinical Pharmacy - II*  
Level: ٤<sup>th</sup> Class, ٧<sup>nd</sup> Semester

No.	Practice Title
١	Communication with physician and patient counseling
٢	Drugs for anemia and related disorders
٣	Cardiovascular drugs in practice part I: diuretics, $\beta$ -blockers, ACE-inhibitors and Ag II receptor blockers
٤	Cardiovascular drugs in practice part II: nitrates, $Ca^{++}$ -channel blockers, $\alpha$ -blockers, and anti-hyperlipidemic drugs
٥	Drugs for asthma and COPD in practice
٦	Antimicrobial drugs in practice part I: $\beta$ -lactam antibiotics, tetracyclines and aminoglycosides
٧	Antimicrobial drugs in practice part II: macrolides, sulphonamides, quinolones, and other miscellaneous antibiotics
٨	Antimicrobial drugs in practice part III: antivirals and antifungals
٩	Drugs for endocrine system part I (Diabetes Mellitus)
١٠	Drugs for endocrine system part II: thyroid disorders, corticosteroids, and hormones used in gynecological disorders
١١	Drugs acting on CNS (antimigraine drugs, analgesics and antiemetics) and musculoskeletal disorders (NSAIDs and bisphosphonates)
١٢	Drugs for GI disorders: peptic ulcer disease and inflammatory bowel disorders
١٣	Drugs for ENT and skin disorders
١٤	Contraception
١٥	Collective practice

Title of the course: ***General Toxicology***

Level: ٤<sup>th</sup> Class, ٧<sup>nd</sup> Semester

**Theory**

No.	Lecture title
١.	<b>Introduction: general consideration; host factor, environmental factors of toxic effects</b>
٢.	<b>Carcinogenesis</b>
٣.	<b>Target organs and systemic toxicology; Respiratory system, Liver, Kidney, Nervous system, cardiovascular system, Blood</b>
٤.	<b>Toxic substances: Food additive and contaminants, Pesticides, Metals, Solvents</b>
٥.	<b>Environmental toxicology: Air pollution, water and soil pollutants, Gases (Tear gas, Pepper spray), CO, Cyanide (H<sup>٢</sup>S).</b>
٦.	<b>Mutagenesis.</b>

Title of the course: ***Practical of General Toxicology***

Level: ٤<sup>th</sup> Class, ٧<sup>nd</sup> Semester

No.	Lab. Title
١.	<b>General introduction to practical toxicology</b>
٢.	<b>Acute toxicity study, determination of LD<sup>٥٠</sup></b>
٣.	<b>Drug toxicity on liver</b>
٤.	<b>Nicotine toxicity</b>
٥.	<b>Pesticide toxicity</b>
٦.	<b>Metal toxicity</b>
٧.	<b>Blood toxicity</b>

٨.	Drug-induced toxicity
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Title of the course: ***Industrial Pharmacy –I***

Level: ٤<sup>th</sup> Class, ٧<sup>nd</sup> Semester

**Theory**

No.	Lecture title
١.	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
٢.	Milling; pharmaceutical application; size measurement methods; theory and energy of comminution; types of mills; factors influencing milling; selection of mill techniques; specialized drying methods
٣.	Drying: definition; purpose; humidity measurement; theory of drying; drying of solids, and classification of dryer; specialized drying methods
٤.	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)
٥.	Sterilization; validation of methods; microbial death kinetics; methods of sterilization (thermal and non-thermal); mechanisms; evaluation
٦.	Pharmaceutical dosage form design; pre-formulation; preliminary evaluation; bulk characterization; solubility and stability analysis
٧.	Pharmaceutical dosage forms; sterile products; development; formulation; production; processing; quality control

Title of the course: ***Practical of Industrial Pharmacy –I***

Level: ٤<sup>th</sup> Class, ٧<sup>nd</sup> Semester

No.	Lab. title
١.	Introduction in industrial pharmacy and pre-formulation
٢.	Effervescent granules: Preparation and characterization

۳.	Flow properties and rheology of granules
۴.	Tablet dosage form: Preparation and characterization
۵.	Evaluation of tablets
۶.	Preparation of children aspirin by wet granulation method
۷.	Sustained release dosage forms: Preparation and characterization
۸.	Coating techniques of tablets

Title of the course: ***Organic Pharmaceutical Chemistry- III***

Level: ۴<sup>th</sup> Class, ۲<sup>nd</sup> Semester

**Theory**

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

Title of the course:

***Practical of Organic Pharmaceutical Chemistry- III***

Level: ۴<sup>th</sup> Class, ۲<sup>nd</sup> Semester

No.	Lab. Title
١.	Cannizaro reaction (part I)
٢.	Cannizaro reaction (part II)
٣.	Re-crystallization of benzoic acid
٤.	Assay of ascorbic acid (known sample)
٥.	Assay of ascorbic acid (unknown sample)
٦.	Synthesis of Phenol
٧.	Assay of phenol (known sample)
٨.	Assay of phenol (unknown sample)
٩.	Synthesis of chlorbutanol
١٠.	Synthesis of paracetamol

Title of the course: ***Pharmacology- III***

Level: ٤<sup>th</sup> Class, ٢<sup>nd</sup> Semester

**Theory**

No.	Lecture title
١.	Hormones of the pituitary and thyroid glands
٢.	Insulin and oral hypoglycemic drugs
٣.	Adreno-corticosteroids
٤.	The gonadal hormones and inhibitors
٥.	Autacoids and autacoid antagonists

٦.	<b>Non-steroidal anti-inflammatory drugs (NSAIDs) and other anti-inflammatory agents</b>
٧.	<b>Drugs used in erectile dysfunction</b>
٨.	<b>Drugs used in osteoporosis</b>
٩.	<b>Drugs used in the management of obesity</b>
١٠.	<b>Cancer Chemotherapy: Anticancer drugs and immunosuppressants.</b>

