



Pharmaceutical Organic Chemistry

Subject: Pharmaceutical Organic Chemistry

Code number: 1703216

Credit hours: 3 hours

Course designation: 2nd year/first semester

Department: Chemical Pharmaceutical

Course syllabus:

1. How to write the correct name for an organic compound using modern Nomenclature (IUPAC and common) system and drawing the structures of organic compounds.
2. How to predict the physical and chemical properties of an organic compound.
3. How to arrange a list of organic compounds according to reactivity towards a particular reagent or acidity and basicity.
4. To write the missing reactants, reagents, or major organic products of chemical equations.
5. To be familiar with most modern synthetic reagents and synthetic methods used in organic chemistry.
6. How to write and explain a detailed step-by-step mechanism for all reaction to which they are exposed.
7. Using reactions learnt to design an original synthesis for any molecule giving to them complete with following the shortest path way.
8. To be familiar with organic chemistry principles required to understand related courses in Pharmacy Curriculum.



Pharmaceutical Organic Chemistry lab

Subject: Pharmaceutical Organic Chemistry lab

Code number: 1703217

Credit hours: 1 hours

Course designation: 2nd year /first semester

Department: Chemical Pharmaceutical

Course syllabus:

1-This course is complementary part to the theoretical lectures.

2- It provides the students important knowledge to acquire good practical skills in the following fields:

- A. Studying different chemical and physical properties of organic compounds using different apparatus.
- B. b-Synthesis of different organic compounds using one step synthesis and more advanced multi steps synthesis.
- C. c-Having a good overview on advanced separation techniques such as chromatography.
- D. Characterization and identification of organic compounds



Biochemistry

Subject: Biochemistry

Code number: 1702221

Credit hours: 2 hours

Course designation: 2nd year /first semester

Department: clinical Pharmaceutical

Course syllabus:

The molecular components of cells. Biomolecules. Water structure & ionization. Acids & bases. Buffers.

Chemistry of Proteins: functions. Amino Acids. Physico-Chemical properties of proteins. Structural organization, & classification

Chemistry of Carbohydrate: Carbohydrate functions. Classification & nomenclature. Structures.

Chemistry of lipids. Classification: simple & complex lipids. Chemical structure, general properties. Lipoproteins.

Chemistry of Nucleotides, purines & pyrimidines

Enzymes: chemical natures, structure, isoenzymes, mechanism of enzymatic action. Properties, regulation of enzymes, mechanism of enzymatic action. Properties, regulation of enzymatic activity, & classification & nomenclature of enzymes.

Bioenergetic.

Introduction in Metabolism of Carbohydrate
Introduction in Metabolism of Lipids

Introduction in Metabolism of proteins and amino acids



Introduction in Metabolism of Nucleotides.

pharmaceutical instrumental analysis

Subject: pharmaceutical instrumental analysis

Code number: 1703218

Credit hours: 2 hours

Course designation: 2nd year/second semester

Department: clinical Pharmaceutical

Course syllabus:

Introduction describes the link between the chemical analysis and instrumental analysis.

Basic concepts of UV and applications including examples from BP and USP.

Basic concepts of fluometry and applications.

Liquid chromatography particularly reversed phase HPLC and applied examples including examples from BP and USP.

Briefs about GC.

Mass spectrometer as chromatographic detector and mass spectrum interpretation.

Brief talk about the NMR basic concepts, applied examples of ¹H-NMR chemical shift.

Applied examples of ¹H-NMR multiplicity.

¹H-NMR chart interpretation.

Steroids.

Brief talk about the IR basic concepts.



Application of IR and ^{13}C -NMR in identification of carbonyl containing compounds.

Quality control and quality by design.

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pharmaceutical instrumental analysis -practical

Subject: pharmaceutical instrumental analysis -practical

Code number: 1703219

Credit hours: 1 hours

Course designation: 2nd year/second semester

Department: clinical Pharmaceutical

Course syllabus :

Give students background information of different methods of analysis especially those related to pharmaceutical analysis as follow:

- 1-Obtain background information of different methods of analysis especially those related to pharmaceutical analysis.
- 2- To choose the appropriate method of analysis for specific cases
- 3- Understand the practical aspects of UV-Visible spectrophotometer and be able to solve problems using this instrument
- 4- Understand chromatographic techniques and how to use thin layer chromatography (TLC) in mixture separation and identification



Physical Pharmacy

Subject: Physical Pharmacy

Code number: 1701231

Credit hours: 3 hours

Course designation: 2nd year /first semester

Department: Chemical Pharmaceutical

Course syllabus :

1. Partitioning and distribution phenomena
2. Complexation phenomena
3. Reaction kinetics and pharmaceutical stability
4. Diffusion phenomena
5. Dissolution phenomena
6. Interfacial Phenomena



Physical Pharmacy lab

Subject: Physical Pharmacy lab

Code number: 1701232

Credit hours: 1 hours

Course designation: 2nd year /first semester

Department: Chemical Pharmaceutical

Course syllabus :

General instruction and general safety instructions

Binary water Phenol Water Mixture

Ternary System

Determination of Distribution Coefficient

Determination of stability constant

Kinetics, Hydrolysis of Methyl acetate



Pharmaceutics

Subject: Pharmaceutics

Code number: 1701233

Credit hours: 3 hours

Course designation: 2nd year/second semester

Department: Pharmaceutics and Pharmaceutical Technology

Course syllabus:

After the completion of this course the student will be able to

- Comprehend the concept of pharmaceutics, different routes of drug administration and basic pharmaceutical calculations.
- Understand the basic principles of solutions, solubility and their properties.
- Understand the development of liquid dosage forms.
- Know the incompatibilities occurring during dispensing and extemporaneous compounding are also considered.



GENERAL PHYSIOLOGY

Course title: General Physiology

Code number: 1702252

Credit hours: 3 hour

Course designation: second year / first semester

Department: Pharmacology and Physiology

Course syllabus:

1 Introduction to physiology

- The internal environment and homeostasis
- Body fluid
- Diffusion



- Osmosis
- Transport of ions & molecules through the cell membrane

2 Overview of

Respiratory and renal system and their role in acid – base balance

3 Excitable Membrane Physiology

Muscle and nerves

4 Overview of

- Autonomic nervous system
- Sensory function of nervous system
- Motor function of nervous system

5 Overview of

Cardiovascular System

Lectures:

8 Lectures to cover for:



Subjects

- Introduction to physiology
- Homeostatic mechanisms
- The internal environment (extracellular fluid)
- The control systems of the body
 - a- negative feedback
 - b- positive feedback
- Transport of ions and molecules through the cell membrane
 - a- Diffusion (passive transport)
 - b- Active transport, co-transport, and counter-transport
- Body fluid
 - a- total
 - b- compartments
 - c- measurement of body fluid volumes
- Basic principles of osmosis and osmotic pressure
- Equilibrium when a change occurs in the volumes and osmolalities and how to calculate fluid shifts
- Edema
 - a- intracellular
 - b- extracellular

9 Lectures to cover the excitable membrane

(Muscle and Nerve):

Subjects

- Origin of bioelectric potentials (The Donnan effect and Gibbs-Donnan equation)
- Ionic bases of the resting membrane potential (RMP)
 - a- nerve
 - b- muscles



- Calculation of the RMP using Nernst equation and Goldman-Hodgkin-Katz (GHK) equation
- Ionic bases of action potential (Na, K, and Ca gates) and its properties
 - a- nerve action potential
 - b- sk muscle action potential
 - c- smooth muscle action potential
 - d- cardiac muscle action potential (five phases)
 1. non-pacemaker action potential
 2. pacemaker action potential
- Propagation of action potential (nerve and muscle)
- The refractory period (nerve, skeletal muscle, cardiac muscle, and smooth muscle)
- Rhythmicity of some excitable tissues
- Excitation of excitable tissues
- Chemical synaptic transmission and synaptic potentials
- Neuromuscular junction and neuromuscular transmission
- The end plate potential and its ionic bases
- The all or none law for excitation and contraction
- The excitation contraction coupling and molecular bases of sk muscle contraction (role of Ca^{++} , troponin, and tropomyosin)
- Mechanics of muscle contraction (isometric, isotonic, and auxotonic contraction)
- Force-velocity relationship and length-tension relationship
- Summation of contraction (clonus and tetanization)
- Smooth muscle contraction; neural and hormonal control)
- The motor unit and recruitment technique
- Resting tension (tone) in the three types of muscles

3 Lectures for overview of the autonomic nervous system:

Subjects

- Introduction and general organization



- Chemical transmission of autonomic junctions (cholinergic and adrenergic transmission)
- Types of cholinergic and adrenergic receptors
- Effect of sympathetic and parasympathetic stimulation on specific visceral organs
- Autonomic reflexes and their role in the regulation of visceral functions

3 Lectures to cover:

- Overview sensory functions of nervous system
- Overview motor functions of nervous system

8 Lectures to cover for Cardio vascular system:

Subjects

- Overview of the CVS
- The myocardium versus the skeletal muscle
- The concept of the preload, afterload, and the myocardial contractility
- The Frank-Starling law of the heart
- The contractility and Ca^{++} kinetics
- The cardiac cycle and cardiac output
- The heart sound and murmurs
- The electrical activity of the heart
- The electrocardiography
- The control of heart rate and cardiac arrhythmias
- Hemodynamics
- a- Blood pressure and blood flow
- b- Microcirculation and lymphatics

5 Lectures to cover for respiratory system and its role in acid-base balance:



Subjects

- Overview of the respiratory system
- Mechanical aspects of breathing
- The respiratory cycle and lung volumes and capacities
- Pulmonary ventilation versus alveolar ventilation
- Pulmonary circulation
- Gas diffusion and gas transport (O_2 and CO_2)
- Hypoxia and asphyxia and artificial respiration
- Regulation of respiration (chemical versus non-chemical control)
- Blood pH and the buffer systems of the body
- Role of the lung in metabolic acidosis and alkalosis



GENERAL PATHOLOGY

COURSE Title: General pathology

Course Code: 1702353

CREDIT HOURS: 2 hours

Course designation: Second year / second semester

Department: Pathology and Microbiology

Course Syllabus:

Lectures

- 1- Introduction to pathology
- 2- Cell injury \ Adaptation Normal cell structure and function
- 3- Cell injury \ Adaptation Reversible cell injury
- 4- Cell injury \ Adaptation Irreversible cell injury
- 5- Cell injury \ Adaptation Irreversible cell injury
- 6- Cell injury \ Adaptation Necrosis
- 7- Cell injury \ Adaptation Programmed cell death
- 8- Cell injury \ Adaptation Cellular adaptation mechanisms
- 9- Cell injury \ Adaptation Ageing
- 10- Inflammation and Repair The acute inflammatory reaction
- 11- Inflammation and Repair Chronic inflammation
- 12- Inflammation and Repair Systemic manifestations
- 13- Inflammation and Repair Healing regeneration
- 14- Inflammation and Repair The connective tissue response
- 15- Inflammation and Repair Healing of skin wounds
- 16- Inflammation and Repair Fracture healing
- 17- Inflammation and Repair Healing in other tissue
- 18- Hemodynamic Disorders Disturbances
- 19- Hemodynamic Disorders Haemostasis



- 20- Hemodynamic Disorders Bleeding disorders
- 21- Hemodynamic Disorders Thrombosis
- 22- Hemodynamic Disorders Abnormalities of blood flow
- 23- Hemodynamic Disorders Abnormalities of blood flow
- 24- Neoplasia Normal control of cell proliferation in tissues
- 25- Neoplasia Abnormalities of growth
- 26- Neoplasia Hypertrophy and hyperplasia
- 27- Neoplasia Metaplasia
- 28- Neoplasia Benign and malignant tumors
- 29- Neoplasia Clinical pathology of tumors
- 30- Neoplasia The cell biology of tumors
- 31- Neoplasia Causation of human cancer
- 32- Revision

Practical session outlines

- 1- Introduction
- 2- Cell injury & adaptation
- 3- Cell injury & adaptation
- 4- Cell injury & adaptation
- 5- Inflammation & repair
- 6- Inflammation & repair
- 7- Hemodynamic disorders
- 8- Revision
- 9- Med Exam
- 10- Neoplasia
- 11- Neoplasia
- 12- Revision



Course title: Anatomy

Course code: 1702251

Credit hours: 6 hours

Course designation: Second year / Second semester

Department: Integrated module

Anatomy:

- 1- Over view of MSS
- 2- Bones of vertebral column
- 3- Intervertebral joints& spinal muscles
- 4- Histology of the skin
- 5- Bones of UL
- 6- Shoulder joints & axilla
- 7- Elbow joints & related muscles
- 8- Wrist, hands& related muscles
- 9- Histology of the muscular tissue
- 10- Bones of LL



- 11- Hip joints & related muscles
- 12- Hip joints & related muscles
- 13- Histology of cartilage & bones
- 14- Knee joints& related muscles
- 15- Ankle joints & related muscles
- 16- Foot
- 17- Development of the skeletal muscles
- 18- Cubital & popliteal fossa
- 19- Development of skull& limbs