2nd stage ; 1st Semster المرحلة الثانية: الفصل الدراسي الأول

Title of the course: *Organic Chemistry II* **الكيمياء العضوية – 2**

Credit hours: **Theory 3 hours Practical 2 hours**
Reference text:

1- Organic Chemistry by Robert T. Morrison and Robert N. Boyd.

2- Organic Chemistry by McCurry; 5th ed.; Thomason learning; CA,USA 2000.

Objectives: To enable students to understand the chemistry of carbon, and the classification, properties and reactions of organic compounds. It includes understanding the basic structure and properties of organic halides, carboxylic acids, aldehydes, ketones and amines, in addition to the principles and application of stereochemistry on these compounds.

Organic Chemistry II

- Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives). 10 Lectures
- Carboxylic acids: properties and reactions. 5
- Functional derivatives of carboxylic acids. 7
- Amines I and II. 6
- Aldehydes and ketones (include also aldol and Claisen condensation); Classification, reactions and properties. 12
- Phenols. 5

Title of the course: *Medical Microbiology* **الاحياء المجهرية الطبية**

Credit hours: **Theory 3 hours, Practical 2 hours**
Reference text: *1.**Medical Microbiology, seventeenth edition E .Jawetz, J.L. Melnick, E.A. Adel 1987 & 2. Principles of microbiology by Roland M**.*
Objectives: To provide a basic understanding of the morphology, anatomy, physiology and genetics of bacteria in addition to the methods of handling, visualizing, characterizing and identifying of bacterial disease.

Medical Microbiology

- Introduction: Importance of microbiology, History of microbiology 2
- Anatomy of bacteria: surface appendages, capsule, cell wall of
- G.+ve & G –ve bacteria, cytoplasmic membrane. 2

- Bacterial physiology: Physical and chemical growth determinants, growth and growth curves, bacterial reproduction. 3

- Genetics: Definition, genetic element, mutation (spontaneous, Gene transfer, transformation, conjugation, and gene transduction). 2

- Recombinant DNA biotechnology. 1

- Sporulation and germination. 1

- Sterilization (chemical + physical Methods) 2

- Chemotherapy and sensitivity test 3

- Staphylococci species 3

- Streptococcus species 3

- Aerobic Spore-forming bacteria Bacillus species (*B. anthracis*, *B.subtilis*, *B. cereus*).2
- *Clostridium perfringens*; *Clostridium tetani*; *Clostridium botulinum* 3
- *Corynebacterium diphtheria* 2
- *Propionibacterium acnes*, *Listeria* 2
- *Mycobacterium tuberculosis*; *M. leprae* 2
- Enterobacteriaceae: (*E. coli; Klebsiella spp.; Citrobacter , Serratia, Salmonella, Shigella*)6
- Vibrio, Pseudomonas, Helicobacter pylori, Neisseria spp., Brucella, Proteus. 6

Title of the course: **Physiology I 1- الفسلجة**

Credit hours/week: **Theory 3 Practical 2**
Reference text: ***Review of Medical Physiology; Ganong W.F (Ed.); 2005.*** and ***Textbook of Medical Physiology by Guyton AC; latest edition.***
Objectives: To enable students understanding the basic principles of physiological functions of different tissues and organs of the human being, and how to evaluate these functions and correlate them with the normal and abnormal conditions. It also emphasizes on the role of homeostatic and hemodynamic changes in the integration of physiological status.

Physiology I

- The general and cellular basis of medical physiology. 5

- Physiology of nerves and muscles: Nerve cells; excitation and conduction; Properties of mixed nerves; glia; neurotrophins; Nerve fiber types and functions; Muscles: Skeletal muscle; smooth muscle; cardiac muscle. Synaptic transmission: Reflexes; cutaneous, deep and visceral sensations; alert behavior, sleep and electrical activity of the brain; control of posture and movement; higher function of the nervous system; central regulation of visceral function; the autonomic nervous system.16

- Respiration: Respiratory zones; Mechanics of respiration; air volumes; respiratory muscles; compliance of the lungs and chest wall; surfactants; differences in ventilation and blood flow in deferent parts of the lung; Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume and flow. Gas transport between the lungs and tissue; Regulation of respiration: Neural control of breathing;

- Respiratory centers; Regulation of respiratory activity: Chemical factors; non chemical factors; Respiratory adjustment in health and disease; Effect of exercise; Hypoxia; Emphysema; Asthma. 8

- Renal Physiology: Introduction; innervations of the renal vessels; renal clearance; renal blood flow; glomerular filtration rate (GFR): Measurements; factor affecting GFR; Filtration fraction; reabsorption of Na+, Cl – and glucose. Tubuloglomerular feedback and glomerulotubular balance; water excretion in: proximal tubules; loop of Henle; distal tubules; collecting ducts; the counter current mechanism; role of urea; water diuresis and osmotic diuresis; acidification of the urine: H+ secretion; reaction with buffers; ammonia secretion; factors affecting acid secretion; bicarbonate execration; regulation of Na+, K+ and Cl– excretion; uremia; acidosis; micturition. 8

- Cardiovascular system: origin and spread of cardiac excitation; the electrocardiogram; cardiac arrhythmias; electrographic findings in cardiac diseases; mechanical events of the cardiac cycle; cardiac output; cardiovascular regulatory mechanisms: Local regulatory mechanisms; systemic regulation by the nervous system; systemic regulation by hormones; Coronary circulation; Hypertension; Heart failure; Angina pectoris. 8

Title of the course: *Physical Pharmacy* **I** **1- الصيدلة الفيزياوية**

Level: 2nd Class, 1st Semester

Credit hours/week: **Theory 3 Practical 2**
Reference text: ***Physical Pharmacy by Alfred Martin et al.***
Objectives: To understand the application of quantitative and theoretical principles of the physical characters of matter in the practice of pharmacy. It aids the pharmacists in their attempt to predict the solubility, compatibility and biological activity of drug products. As a result of this knowledge it will help in the development of new drugs and dosage forms as well as in improvement of various modes of administration.

Physical Pharmacy I

- States of matter, binding forces between molecules, gases, liquids, solid and crystalline matters; phase equilibria and phase rule; thermal analysis. 10

- Thermodynamics, first law, thermochemistry, second law, third law, free energy function and applications. 8

- Solutions of non-electrolytes, properties, ideal and real colligative properties, molecular weight determination.7

- Solution of electrolytes, properties, Arrhenius theory of dissociation, theory of strong electrolytes, ionic strength, Debye-Huchle theory, coefficients for expressing colligative properties. 5

- Ionic equilibria, modern theories of acids, bases and salts, acid-base equilibria, calculation of pH, acidity constants, the effect of ionic strength and free energy. 8

- Buffered and isotonic solutions: Buffer equation; buffer capacity; methods of adjusting tonicity and pH; buffer and biological system. 7