

جامعة درنة - كلية الطب البشري - قسم الدراسات العليا

(الجراحة)

“Surgery”



FACULTY OF MEDICINE

SYLLABUS

“MEDICAL BIOCHEMISTRY”

**Academic Course for Postgraduate Students in
M.S. Surgery**

(2022 – 2023)

I) What is Medical Biochemistry?

Medical Biochemistry contracts with clinical applications oriented toward human body and biology. It concerned with the study of the chemistry and the metabolism of lipids, carbohydrates, proteins, nucleotides and nucleic acids, enzymes, metabolic regulation, clinical nutrition, minerals, body fluids, biochemical endocrinology and related topics.

It provides information about the molecular level of the complex chemical structures and accompanying reactions that determine biological processes such as metabolism, reproduction and growth, and their regulation.

II) Course Specifications:

- 1) Course Title:** Medical Biochemistry (First academic semester of M.S. Surgery Program).
- 2) Code:** 23-301-bio
- 3) Course Duration:** 16 Weeks of teaching with final end Semester examination.
- 4) Total Theoretical Teaching Hours:** 32 hours.
- 5) Course Director:** Associate Professor **Dr. Amal Rajab Agila**

III) Course Tasks:

Medical Biochemistry course provides postgraduates students with:

- 1) A broad understanding of the fundamental information that operate in health and disease.
- 2) Pursuit of excellence in research in areas related to national and international health problems.
- 3) Encourages combination of scientific thinking in learning and research.

IV) Course Aims:

The aims of this course are to enable the postgraduate students to:

- 1) Recognize the basic biochemical processes taking place in the body.
- 2) Know abnormal and pathological conditions, which are related to biochemical defects.
- 3) Understand at molecular level the complex chemical structures and accompanying reactions that determine the biological processes.
- 4) Follow the rapidly changing and inflating details about molecular biology and genetics
- 5) Integrate biochemical data with the ongoing basic medical sciences.
- 6) Develop the basic scientific research skills as well as effective communication and team work attitudes.

V) Intended Learning Outcomes (ILOs):

Knowledge: At the end of the course the postgraduate students should know:

- i. Structure, properties and metabolism of the major classes of biochemical compounds including carbohydrates, lipids, proteins, amino acids and nucleic acids (molecular biology).
- ii. Enzymes, action, different classes and their applications in the metabolism.
- iii. Vitamins, structures, functions and their deficiency manifestations.
- iv. Body fluids, biological membranes, and relate their operation to their structure components.
- v. Hormones, Xenobiotics and Heme metabolisms.
- vi. Integration of metabolism.
- vii. Clinical nutrition.

VI) Theoretical Course Contents:

Ser.	Subjects	Lectures Hours
1	<u>Physical Chemistry & Water:</u> -Acids, Bases, Acidosis, Alkalosis, pH and Buffers, Expression of Concentration. Type of Water Bonds, Osmotic Pressure & Its Importance, Viscosity, Surface Tension, Absorption, Elution and Colloid, Electrolytes	2
2	<u>Carbohydrates Metabolism:</u> -Carbohydrates Classifications, Types, Properties, Functions, Catabolic Pathways of Glucose & Regulation, Glycogen Metabolism, Diabetes Mellitus.	2
3	<u>Lipids Metabolism:</u> - Lipids Classifications, Properties, Functions, Lipid Oxidation, Antioxidants, Catabolic Pathways of Lipids & Regulation, Plasma Lipoproteins & Related Diseases.	2
4	<u>Proteins Metabolism:</u> -Amino acids: Functions & Classification, Proteins: Structures, Types, Properties, pathways for amino acids & Related Diseases.	2
5	<u>Clinical Enzymology:</u> Definitions, Classification, Inhibition, Regulation & Medical Importance.	2
6	<u>Nucleic Acids Metabolism:</u> - Pyrimidines & Purines: Structures, Functions, Classifications. -Nucleosides & Nucleotides: Structures, Types, Functions, Analogues, Importance. - DNA: Structures, Function, Replication. Mutation, Repair. -RNA: Types, Functions, Synthesis, Modifications, Differences between DNA & RNA.	2
7	<u>Hormones & Xenobiotics:</u> The hormonal actions, effect, functions, site of secretion and factors affecting it.	2
8	<u>Heme Metabolism:</u> -Heme Synthesis, Catabolism, Types,	2

	Structures.	
9	<u>Minerals:</u> Types, Functions, Sources, Deficiency, Recommended daily allowance, Sources, Metabolism.	2
10	<u>Vitamins:</u> Definition, classifications, Structures Functions, Metabolism, Deficiency, Hypervitaminosis, Recommended daily allowance & Sources.	2
11	<u>Body Fluids:</u> Blood, lymph, Urine, Milk, Semen, Cerebrospinal Fluids, Amniotic Fluid, Sweat, Tears, Vitreous Humor, Synovial, Ascetic, Pleural Fluids.	2
12	<u>Cell Membrane:</u> Features, Structure, Factors Affecting Membranes Fluidity, Defects in Biological Membranes, Causes & Diseases.	2
13	<u>Immunochemistry:</u> Immunoglobulin: types, Basic Structures, Antigens: Structure and Properties	2
14	<u>Clinical Nutrition:</u> Energy value of foods, Distribution of calories in the diet, Nutritional Importance of Foods.	2
15	<u>Integration of Metabolism:</u> - Interconversion of food stuffs.	2
16	<u>Bioenergetics:</u> -Responses of different tissues in fed and starving conditions.	2
Total		32