

## **Biochemistry department**

### **- Vision**

Department of Biochemistry, Faculty of Pharmacy - October 6 University aiming to become of the pioneers in the field of biochemistry Science at the regional level in 10 years.

### **- Mission**

- Provide high-quality education and an educational experience for undergraduates.
- Cultivate students' scientific thought to be based on post-graduation from the ability to innovate and then global competition.
- Embrace continuous improvement in biochemical sciences.
- Build a climate would provide graduates with the skills and awareness of the ethics of scientific research.
- Arm biochemistry professionals with the knowledge, skills and values required to meet the need for high-level specialists.
- Support and maintain the best academic research and the faculty members technically qualified.

### **- The department teaches the following courses:**

<b>Course Code</b>	<b>Course Name</b>
BIO 301	Biochemistry (1)
BIO 302	Biochemistry (2)
BIO 403	Clinical Biochemistry

### **- The department Supervises teaching the following courses:**

<b>Course Code</b>	<b>Course Name</b>
ENG 100	English (1)
ENG 101	English (2)
ENG 102	Medical Terminology

<b>Laboratories of Biochemistry Department</b>			
<b>Laboratory</b>	<b>Lab no.</b>	<b>Floor</b>	<b>Location</b>
<b>Preparation Room</b>	<b>1001-A</b>	<b>Ground</b>	<b>Al-Shahid Ahmed Hamdy Building</b>
<b>1</b>	<b>1001</b>		
<b>2</b>	<b>1006</b>		

<b>3</b>	<b>1006 (between Pharmacy and Engineering faculty)</b>		
<b>4</b>	<b>1007 (between Pharmacy and Engineering faculty)</b>		
<b>5</b>	<b>2313</b>	<b>Third</b>	<b>Saad Zaghloul Building</b>

- **Course Description:**

**First Level**

**1- First Semester**

<b>Code</b>	<b>ENG 100</b>	<b>Credit hours</b>		
<b>Title</b>	<b>English (1) (University requirement)</b>	<b>L*</b>	<b>P/T**</b>	<b>Total</b>
<b>Pre-requisite</b>	None	1	-	1

**Course content:**

This course covers the following:

**A) Heals, Illness, Sickness and Disease:**

- Vocabulary building in academic English
- Countable and Uncountable Nouns

**B) Parts of the body:**

- Talking about pain
- Doctor and Patient Dialogue
- Pharmacy Dialogue
- Forms of Pain
- Have, Take, Make or Do?
- Present Simple

**C) Functions of the Body:**

- Pronunciation
- Collocation
- Relationship: synonyms, antonyms, homonyms, meronyms, hyponyms
- Collocations (Word Partners)

**First Level****2- Second Semester**

<b>Code</b>	<b>ENG 101</b>	<b>Credit hours</b>		
<b>Title</b>	<b>English (2) (University requirement)</b>	<b>L*</b>	<b>P/T**</b>	<b>Total</b>
<b>Pre-requisite</b>	English (1)	1	-	1

**Course content:**

This course covers the following:

**A) Nurses:**

- Comparatives & Superlatives
- Past Simple

**B) Booking a Doctor's Appointment:**

- Communication: Phone Calls
- Using Formal and Informal English

**C) A Visit to a Doctor:**

- Words & Expressions

**D) The Writing Process:**

- The Writing Process
- Paragraph Writing
- Punctuation
- Confirming changes in writing: Faxes & Emails

**Second Level****1- First Semester**

<b>Code</b>	<b>ENG 102</b>	<b>Credit hours</b>		
<b>Title</b>	<b>Medical Terminology (University requirement)</b>	<b>L*</b>	<b>P/T**</b>	<b>Total</b>
<b>Pre-requisite</b>	English (2)	2	-	2

**Course content:**

This course covers medical term components (rules for forming and spelling medical terms; defining medical terms through word structure analysis; formation of medical terms; spelling and pronunciation), prefixes (pertaining to colours, numbers, negative, positive, directions, time and size), roots (pertaining to physics, chemistry, and miscellaneous.), suffixes (symptomatic, diagnostic, operative as well as some general suffixes.), fields of medical practice (including special medical practice of physicians), medical records symbols and pharmaceutical abbreviations, body organs and parts (integumentary system, gastrointestinal system, respiratory system, cardiovascular system, endocrine system and nervous system).

**Third Level****1- First semester**

Code	BIO 301	Credit hours		
		L*	P/T**	Total
Pre-requisite	Pharmaceutical Organic Chemistry (2)	2	1	3

**Course content:**

This course covers the following:

**Cell structure and biological membrane:**

Structure of animal cell - Biological membranes structure - Mechanisms of transport across membranes.

**Amino acids & protein chemistry:**

Types & classification of AAs - Techniques for separation of AAs & proteins - Classification of proteins - Levels of protein structure - Bonds that stabilize protein structure - Denaturation - Plasma proteins - Immunoglobulins.

**Enzymes:**

Nature of enzyme-substrate complex - Enzyme specificity - Coenzymes - Enzyme kinetics ( $K_m$ ,  $V_{max}$ ) - Enzyme inhibition - Regulation of enzymatic activity - Allosteric enzymes - Isoenzymes

**Nucleic acids & protein synthesis:**

Nucleosides & nucleotides - DNA structure - DNA replication - Types of RNA Genetic codes - DNA transcription - Steps of protein synthesis - Genetic engineering and recombinant DNA

technology.

**Porphyrins:**

Hemoglobin (Types, Function - Role of 2,3 DPG) - Bohr effect - Hemoglobinopathies – Myoglobin - Porphyrins metabolism - Types of Jaundice.

**Biological oxidation:**

Respiratory chain & Enzymes of Oxidation Reduction Reactions- Oxidative Phosphorylation- Malate & Glycerophosphate Shuttles. amino acids and protein chemistry, enzymes, nucleic acid and protein synthesis, porphyrins and biological oxidation.

**Third Level**

**2- Second semester**

Code	BIO 302	Credit hours		
Title	Biochemistry (2)	L*	P/T**	Total
Pre-requisite	Biochemistry (1)	2	1	3

**Course content:**

This course covers the following: Carbohydrate metabolism: glycolysis, krebs cycle, glycogen metabolism, gluconeogenesis, hmp-shunt, fructose, galactose metabolism, regulation of blood glucose and metabolic defects in d.m, lipid metabolism: introduction of lipid classification, chemical structure, digestion and absorption, denovo synthesis of fatty acids and their elongation and desaturation, triglycerides, mobilization of stored fat,  $\beta$ -oxidation of fatty acids, ketone bodies, major membrane lipids and phospholipids metabolism, glycolipid, cholesterol and lipoprotein metabolism, prostaglandins, proteins and amino acids metabolism: introduction for aminoacid metabolism, digestion and absorption, fate of aminoacids and carbon skeleton, urea cycle, and its regulation, ammonia toxicity ,metabolism of glycine, serine, methionine, cysteine, one carbon group transfer, metabolism of phenylalanine and tyrosine, metabolism of tryptophan, branched chain aminoacids, metabolism of histidine and arginine and metabolism in well fed and fasting state

**Fourth Level**

**1- First semester**

<b>Code</b>	<b>BIO 403</b>	<b>Credit hours</b>		
<b>Title</b>	<b>Clinical Biochemistry</b>	<b>L*</b>	<b>P/T**</b>	<b>Total</b>
<b>Pre-requisite</b>	Biochemistry (2)	2	1	3

**Course content:**

This course covers disorders of carbohydrate metabolism: laboratory investigations (BG, Insulin/G ratio, C-peptide), metabolism of lipoproteins, LDL receptors, preparation of a patient before sampling for blood lipids, plasma appearance. Serum total cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides, risk factors for CHD (TC/HDL-C, LDL/HDL). Hyperlipoproteinemia: Primary (I-V) and secondary types, clinical manifestations of hyperlipidemia: arterial wall, atherosclerosis, subcutaneous tissue, tendons, cornea, management of hyperlipidemia: dietary, drugs. Hypolipoproteinemia, fatty liver, aminoaciduria, glycinuria, hyperoxaluria, cystinuria, cystinosis, homocystinuria, phenylketonuria, tyrosinemia, alkapttonuria, hartnup disease, maple syrup urine disease, investigation of renal function, investigation of liver function. Myocardial infarction, metabolic disorders of calcium and phosphate, endocrine abnormalities, molecular biology.

- **Elective Courses**

<b>Code</b>	<b>BIO 600</b>	<b>Credit hours</b>		
<b>Title</b>	<b>Applied Molecular Biology</b>	<b>L*</b>	<b>P/T**</b>	<b>Total</b>
<b>Pre-requisite</b>	Clinical Biochemistry	2	1	3

**Course content:**

This course covers recombinant DNA technology, tools of recombinant DNA technology, enzymes, restriction endonuclease, passenger DNA, vector DNA, chimeric, hybrid or recombinant DNA, DNA cloning, DNA libraries, blotting and hybridization, polymerase chain reaction.