



Course Specification

— (Bachelor)

Course Title: Biochemistry
Course Code: 2053101-3
Program: Bachelor in Biotechnology
Department: Biotechnology Department
College: College of Science
Institution: Taif University
Version: V4
Last Revision Date: 3/1445 – 9/2023



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A. General information about the course:

1. Course Identification

1. Credit hours:					
3 (2 Lecture, 1 Lab)					
2. Course type					
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department	<input type="checkbox"/> Track	<input type="checkbox"/> Others
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective		
3. Level/year at which this course is offered: (5th level/3th year)					
4. Course general Description:					
The biochemistry course involves the study of the molecular composition of living cells, the organization of biological molecules within the cell, and the structure function relationship of these biological molecules. This includes the studying of the four key biological macromolecules including proteins, carbohydrates, nucleic acids, and lipids, major components of cell membranes. The course also will cover the general metabolism of carbohydrates, proteins, and lipids, as well as the basics of biochemical reactions and enzyme kinetics.					
5. Pre-requirements for this course (if any):					
2052203-3, Molecular Biology					
6. Co-requirements for this course (if any):					
Not applicable					
7. Course Main Objective(s):					
This course will introduce students to the structure and functions of macromolecules, general metabolism of carbohydrates, proteins, and lipids, as well as the basics of biochemical reactions and enzyme kinetics.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> ● Traditional classroom ● E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)



No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	15
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize structures and functions of different macromolecules	K.2	Lecture	Written Exams
1.2	List the main features of general metabolism	K.2	Lecture	Written Exams
1.3	Explain the basics of biochemical reactions and enzyme kinetics	K.2	Lecture	Written Exams
2.0	Skills			
2.1	Analyze the application of biotechnology	S4	Project	Written Practical Exam
3.0	Values, autonomy, and responsibility			
3.1	Participate in a teamwork during project activities	V1	Discussion	Report





C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Biochemistry and composition of the living matter	2
2.	Structure and functions of carbohydrates (mono-, di-, polysaccharides)	4
3.	Structure and function of proteins, amino acids, various levels of protein structure (primary, secondary, tertiary, quaternary), functions of proteins.	4
4.	Structure and function of lipids, fatty acids, glycerol, triglycerides, phospholipids, and their biological functions in membrane structure	4
5.	Basics of biochemical reactions and enzyme kinetics	4
6.	General metabolism of carbohydrates and energy production; glycolysis, citric acid cycle (TCA), electron transport chain (ETC), gluconeogenesis.	4
7.	General metabolism of lipids; fatty acids degradation (B oxidation), fatty acid biosynthesis, phospholipid metabolism, triglyceride metabolism.	4
8.	General metabolism of proteins; metabolism of amino acids and peptides	4
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	Week 7	20%
2.	Periodical exam	Week 10	10%
3.	Report	Week 11	10%
4.	Practical Exam	Week 15	20%
5.	Final Exam	Week 16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Author: Victor Rodwell, David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil ISBN-13: 9780071825344 Lehninger's Principles Of Biochemistry 5e 2. Modern Genetic analysis book
Supportive References	Harpers Illustrated Biochemistry 30th Edition
Electronic Materials	http://medstudent.net/biochemistry.html (biochemistry for medical students)





	<p>Concepts in Biochemistry: http://www.wiley.com/legacy/college/boyer/0470003790/chapter/chapter.htm The Medical Biochemistry Page: http://themedicalbiochemistrypage.org/</p>
Other Learning Materials	<p>https://www.wiley.com/college/boyer/0470003790/animations/animations.htm Interactive Biochemistry</p> <p>Online videos of cellular process, divisions, movement, communications</p>

2. Required Facilities and equipment

Items	Resources
<p>facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)</p>	<p>One classroom with internet connection for 2 hours a week and one laboratory for 3 hours a week with internet facility.</p>
<p>Technology equipment (projector, smart board, software)</p>	<p>1. Projector for each classroom 2- Projector in each laboratory</p>
<p>Other equipment (depending on the nature of the specialty)</p>	<p>2. Spectrophotometer 3. Kits for measuring glucose and lipids 4. 3-DNA and protein gel electrophoresis sets 5. Chemicals needed for descriptive and quantitative tests of protein, amino acids, carbohydrates and fats.</p>

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer Review, Students	Direct (Independent Reviewer), Indirect (survey)
Effectiveness of Students assessment	Faculty members	Direct (Random Correction)
Quality of learning resources	Students	Indirect
The extent to which CLOs have been achieved	Faculty members	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	6





DATE

5/11/2023

