Course Specification
(Bachelor)

Course Title:	**Biochemistry**
Course Code:	**CEM 360**
Program:	**CHEMISTRY**
Department:	**CHEMISTRY**
College:	**COLLEGE OF SCIENCE**
Institution:	**MAJMAAH UNIVERSITY**
Version:	**TP-153**
Last Revision Date:	**11 December 2024**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐ University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (5th)					
4. Course General Description:					
The course deals with the chemical composition, properties, and biological functions of biochemical molecules. These include carbohydrates, proteins, lipids, enzymes, nucleic acids ,vitamins, and various hormones. The practical part involves the use of qualitative and quantitative methods for the detection, identification, and assays of these molecules .					
5. Pre-requirements for this course (if any)**:**					
CEM 231					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
By the end of this course the student will be able to: **i. Know the chemistry of carbohydrates, their classifications, biological functions, nomenclature, and the important reactions of carbohydrates.** **ii. Know the chemistry of proteins and amino acids, their biological functions, classifications, reactions of amino acids.** **iii. Describe enzymes, their classifications, and their role in the biological reactions** **iv. Know the structure of nucleic acids and their biological functions.** **v. Know the chemistry of lipids and fatty acids, their biological functions, and their classifications.** **vi. Know the structure of vitamins, their types, their biological functions, and diseases related to vitamin deficiency.**					

vii. Know the different types of hormones and their biological role in the human body.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	58	100
2	E-learning		
3	Hybrid • 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**	28
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)homework,study**	60
Total		118

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define the concepts and principles of biochemistry and related sciences, along with the ability to evaluate and interpret biochemistry principals	K1	-Lectures. Discussions - Brainstorming	-Midterms exam - Quizzes - Homework - Final exam -Electronic exam

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
				Class exercises -
2.0	**Skills**			
2.1	Perform the Laboratory experiments using the right scientific methods and proper safety procedures.	S1	Practical section	continuous assessment (rubric) Practical test Lab report
2.2	Communicate effectively orally and written using appropriate presentation methods for different biochemical issues with recipients of different types	S2	**-Lecture** Group discussions - Brainstorming	-Written exam -Homework -presentstion
...				
3.0	**Values, autonomy, and responsibility**			
3.3	Self-development, assess own learning and performance and autonomously make decisions regarding self-development and/or tasks based on convincing evidence.	V3	-Do assignment (research-presentation-work sheet-lab report)	Homework -presentstion (rubric) -lab report

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction of biochemistry	2
2.	Carbohydrate	6

3.	Lipids and fatty acids	4
4.	Protein and amino acid	2
5.	Enzymes	2
6.	Nucleic acid	6
7.	Vitamins	4
8.	Hormones	4
9.	Practical section	28
Total		**58**

D. Students Assessment Activities

No	Homework	Continues	5%
1.	1st Mid-term exam	7th	10%
2.	2nd Mid-term exam	12th	10%
3.	Homeworks and Quizzes	Continuous	5%
4.	Presentation	One/semester	5%
5.	Electronic exam	15th	10%
6.	Final exam (Practical)	17th-19th	20%
7.	Final Theoretical exam	End of term	40%
Total			100%

*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	1- Berg, J.M., Tymoczko, J.L. & Stryer, L. (2011). Biochemistry. Freeman, 7th edition. 2-Wilson, K. & Walker, J. (2010). Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press, 7th edition.
Supportive References	1- Science Direct - Science Direct Database. 2- Research oriented summaries of important topics in Biochemistry and molecular biology are contained in the monthly journal Trends in Biochemical Sciences (TIBS). **3-** A similar journal is Bioassays. **4-** Scientific American journal usually contains at least one biochemical article per issue.
Electronic Materials	CDs from various books of Chemistry whatever are available in the library
Other Learning Materials	Relevant Website

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, E- learning, balckboard
Technology equipment (projector, smart board, software)	data show, Smart Board
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Course Evaluation Survey Quality of Exam Survey
	Faculty	CLO Mapping with teaching & assessment. Course Blueprinting Grade Analysis Psychometric Analysis
	Peers	Grade Verification
Effectiveness of Students assessment	Faculty member / Quality assurance committee	Direct assessment outcome analysis Course report preparation
Quality of learning resources	Students / Faculty	Academic advising survey Student experience survey
The extent to which CLOs have been achieved	Quality assurance committee	Outcome analysis
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Chemistry Department council
REFERENCE NO.	17
DATE	**14-6-1446 H**