هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Fundamentals of Biochemistry
Course Code:	BIOC1251
Program:	Elective natural and social sciences (GEE-S)
Department:	Biochemistry
College:	Faculty of Science
Institution:	University of Tabuk
Version:	
Last Revision Date:	8 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 credit hours (2 Theoretical +1 Practical)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☐ Required		☒ Elective		
3. Level/year at which this course is offered: (.....)					
4. Course general Description:					
The course describes fundamentals of biochemistry such as chemical structure, physical properties, and functions of carbohydrates, proteins and amino acids, lipids and fatty acids and other biomolecules.					
5. Pre-requirements for this course (if any):					
NA					
6. Co-requirements for this course (if any):					
NA					
7. Course Main Objective(s):					

This course will provide insight to familiarize students with knowledge of:

1. Basic biochemistry needed for higher level courses
2. Chemical concepts with reference to chemical process found within living
3. cells (chemical bonds, functional groups, equilibrium, and energy)
4. Structure and properties of water and buffers
5. Structure and properties of amino acids, peptide bond
6. Structure and properties of proteins and structural & functional classification.
7. Introduction to enzymes and metabolism
8. Introduction to sugars and carbohydrates
9. Introduction to fatty acids and lipids

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	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**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

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	Describe the living cell and its components	**ILO1**	Lecture, self-learning, and Group discussion	Participation - exams – assignment
1.2	Define basic concepts of biochemistry	**ILO1**	Lecture, self-learning, and Group discussion	Participation - exams – assignment
	Describe the role of biomolecules in living cells	**ILO1**	Lecture, self-learning, and Group discussion	Participation - exams – assignment
2.0	**Skills**			
2.1	Distinguish between carbohydrates, proteins, fats and nucleic acids.	**ILO2**	Lecture and Active-learning -Group discussion	Participation - exam - assignment- Report

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Determine the role of enzymes and their importance.	**ILO2**	Lecture and Active-learning -Group discussion	participation, project، Report
2.3	Compares the different types of vitamins, enzymes, and hormones	**ILO2**	Lecture and Active learning	Exams-report
3.0	**Values, autonomy, and responsibility**			
3.1	Able to evaluate the problems and suggest the solutions	**ILO7**	Lectures- self-learning -lab-project	Presentation - Participation - report-project
3.2	Able to participate in the development of the community in the work field.	**ILO7**	Lectures- self-learning -lab-project	Presentation - Participation - report-project

C. Course Content

No	List of Topics	Contact Hours
1	Overview of Biochemistry and its Principles	2
2	Water, pH concepts & buffers	2
3	Amino acids importance & their Chemical structure and Classification	2
4	Proteins Structure and Functions	2
5	Introduction to Enzymes	2
6	Introduction to Carbohydrates: Monosaccharides	2
7	Introduction to Carbohydrates: Disaccharides, oligosaccharides and polysaccharides	2
8	Med Term Exam	2
9	Introduction to Lipid: simple lipid	2
10	Introduction to Lipid: complex and derived lipid	2
11	Introduction to Nucleic acids: nucleosides and nucleotides.	2
12	Introduction to Nucleic acids: DNA, RNA, and Central dogma	2
13	Introduction to vitamins: water-soluble vitamins	2
14	Introduction to vitamins: lipid-soluble vitamins	2
15	Introduction to Hormones	2
No	**Laboratory Topics**	**Contact Hours**
1	Laboratory Health and Safety including Risk Assessments	2
2	Laboratory Tools and Glassware	2
3	Ninhydrin test	2
4	Bruit test	2

5	Molisch Test	2
6	Benedict's Test	2
7	Iodine/Potassium Iodide Test	2
8	Copper acetate test	2
9	Unsaturation Test	2
10	Solubility test	2
11	Saponification test	2
12	Salting out test	2
13	Acrolein test	2
14	DNA extraction from fruits	2
15	Final exam	2
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *		Assessment timing (In week no)	Percentage of Total Assessment Score
1.	Quiz		during semester	10%
2.	Oral Discussion and Questions		during semester	5%
3.	Mid-term exam		9	20%
4.	Lab	Lab Report	11	15%
		lab Exam		10%
5.	Final exam		17	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	● Victor Rodwell, David Bender, Kathleen Botham, Peter Kennelly, P. Anthony Weil. Harper's Illustrated Biochemistry. McGraw Hill / Medical; 31st edition (2018). ● P. C. Champe, R. A. Harvey. Lippincott's Illustrated Reviews Biochemistry. Wolters Kluwer Health. 8 th edition (2021). ● David, L. Nelson; Michael M. Cox. Leininger Principals of biochemistry. (2021). Macmillan Learning

Supportive References	Oxford journal of Biochemistry: http://jb.oxfordjournals.org/ American journal of Biochemistry: http://www.sapub.org/journal/aimsandscope.aspx?journalid=1012
Electronic Materials	http://www.biology.arizona.edu/default.html http://mcb.harvard.edu/BioLinks.html
Other Learning Materials	Computer based programs. Handouts and Multimedia associated textbook

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, laboratories
Technology equipment (projector, smart board, software)	Projector, smart board
Other equipment (depending on the nature of the specialty)	Chemicals and equipment to conduct experiments

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Students	Direct (Exams) Indirect (Survey)
Effectiveness of Students' assessment	Students Faculty members	Indirect (Survey) Direct (Report)
Quality of learning resources	Students Faculty members	Indirect (Survey) Indirect (Survey)
The extent to which CLOs have been achieved	Students Program Leaders	Indirect (Survey) Direct (Annual report)

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**PROGRAMS AND PLANS COMMITTEE**
REFERENCE NO.	
DATE	**8 OCTOBER 2023**