هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications

Course Title:	**Biochemistry**
Course Code:	**2043106-3**
Program:	**Bachelor in Chemistry**
Department:	**Department of Chemistry**
College:	**College of Sciences**
Institution:	**Taif University**

Table of Contents

A. Course Identification

1. Credit hours: 3 (2 Theoretical, 1 Lab)
2. Course type **a.** University ☐ College ☐ Department √ Others ☐ **b.** Required √ Elective ☐
3. Level/year at which this course is offered: 7th Level /3rd Year
4. Pre-requisites for this course (if any)**: Organic Chemistry 2 (2042203-3)**
5. Co-requisites for this course (if any)**: NA**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	3 Theoretical and 2 Practical hours/ Week	100 %
2	**Blended**	-	-
3	**E-learning**	-	-
4	**Distance learning**	-	-
5	**Other**	-	-

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	20
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	**50**

B. Course Objectives and Learning Outcomes

1. Course Description

The course concerns about the chemistry of carbohydrates, proteins, amino acids, Nucleic acids and Lipids.

2. Course Main Objective

The course aims to enrich students with essential fundamentals of the active constituents in plant and animal cell and the biological importance of carbohydrates, proteins, fats and nucleic acids in life cell. The course refers to the different industries of oils and fats.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding:**	
1.1	Define the classes and importance of carbohydrates, proteins, fats and nucleic acids	K1
1.2	Memorize the chemical reactions of carbohydrates, proteins, fats and nucleic acids	K2

CLOs		Aligned PLOs
2	**Skills:**	
2.1	Apply the rules to differentiate between the classes of carbohydrates	S1
2.2	Explain the importance of biochemistry in environmental issues	S3
3	**Values:**	
3.1	Illustrate the concept of personal responsibility for achieving duties by teamwork.	V1
3.2	Represent the academic ethics and responsibility	V2

C. Course Content

No	List of Topics	Contact Hours
1	Section 1: Carbohydrates introduction, definition. General properties of different sugars, chemistry, structure of monosaccharides	3
2	Section 2: Chemical reactions of monosaccharides (reduction- oxidation- glycosides formation) and oligosaccharides	3
3	Section 3: Polysaccharides physical and chemical properties, chemical reactions	3
4	Section 4: Amino acids structure and their chemistry	3
5	Section 5: Peptides formation conformation and biological activities inside living cells	3
6	Section 6: Proteins structures and biological activities and bonds responsible about structure	3
7	Section 7: Nucleic acids and their components in single and double structure	3
8	Section 8: Enzymes as biological catalysts	3
9	Section 9: Lipids, different industries from oils and fats	3
10	Section 10: phospholipids, glycolipids and steroids	3
Total		**30**

Lab Content

No	List of topics	Contact Hours
1	Introduction to biochemistry Lab: Safety, Instrumentations, Extraction of carbohydrates from different samples	2
2	Qualitative analysis of carbohydrates; general tests	2
3	Qualitative analysis of carbohydrates; reduction tests	2
4	Qualitative analysis of carbohydrates; specific tests	2
5	Qualitative analysis of amino acids; general tests	2
6	Qualitative analysis of amino acids; specific tests	2
7	Qualitative analysis of proteins; general and specific tests	2
8	Qualitative analysis of oils and fats; general tests	2
9	Qualitative analysis of oils and fats; specific tests	2
10	General unknown tests	2
Total		**20**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Define the classes and importance of carbohydrates, proteins, fats and nucleic acids	Lecture	Written exam
1.2	Memorize the chemical reactions of carbohydrates, proteins, fats and nucleic acids	Lecture	Written exam
2.0	**Skills**		
2.1	Apply the rules to differentiate between the classes of carbohydrates	Discussion	Homework Assignments
2.2	Explain the importance of biochemistry in environmental issues	Problem-Solving	Practical tasks and Exam
3.0	**Values**		
3.1	Illustrate the concept of personal responsibility for achieving duties by teamwork.	Collaborative Learning	Individual presentations
3.2	Represent the academic ethics and responsibility	Collaborative Learning	Individual presentations

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework Assignments	Throughout Semester	5%
2	Individual presentations	Throughout Semester	5%
3	Mid Term Exam	6	20%
4	Practical tasks	Throughout Semester	25%
5	Final practical Exam	10/11	5%
6	Final exam	11/12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Commitment to the rules of the Academic Advising Department at the university in accordance with the academic guidance manual approved by the university and the attached forms, there are different arrangements made by teaching staff to support student consultations including;
- Office hours: 8 hours per a week for each academic member.
- Academic guidance: an academic member has a number of students to guide them throughout degree journey.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	• Lehninger Principles of biochemistry, David L. Nelson and Michael M. Cox (2021). Macmillan Higher Education (USA), Latest Edition. ISNB: 9781319381493.

	https://tinyurl.com/2p8u5e5w
Essential References Materials	• Biochemistry A short course, John L. Tymoczko, Jermy M. Berg and Lubert Stryer (2013).W.H Freeman and company (USA), Latest Edition. ISNB: 9871429283601. https://tinyurl.com/mry4zpvr
Electronic Materials	• Saudi Digital Library (SDL) https://apps.tu.edu.sa/sdl/default.aspx
Other Learning Materials	• Learning Management System (Black board) https://lms.tu.edu.sa/ • Computer programs for graphing biomolecules and chemical reactions.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	-Lecture hall with 100 seats. -Equipped Lab with essential instrumentations.
Technology Resources (AV, data show, Smart Board, software, etc.)	Computer and data show with Wi-Fi access. smart board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching and assessment	Students	Survey (indirect method)
Extent of achievement of course learning outcomes	Program leader	Reports (Direct method)
Quality of learning resources	Peer referees Students	Reports (Direct method) Survey (indirect method)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Department Council/ Quality assurance committee**
Reference No.	2-5-1444
Date	01/11/2022