



Course Specifications

Course Title:	Biochemistry
Course Code:	450BCH-3
Program:	Bachelor of Science in Chemistry
Department:	Chemistry
College:	Science
Institution:	King Khalid University

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A. Course Identification

1. Credit hours:	3 (2+1)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level 8 / Year 4
4. Pre-requisites for this course (if any):	313CHEM-2-S
5. Co-requisites for this course (if any):	No Co-requisite

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	66%
2	Blended	0	0%
3	E-learning	0	0%
4	Correspondence	0	0%
5	Other (Practical)	1	34%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	2
4	Others (specify)	0
	Total	60
Other Learning Hours*		
1	Study	30
2	Assignments	15
3	Library	0
4	Projects/Research Essays/Theses	0
5	Others (specify)	0
	Total	45

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description
 The course is divided to two parts: chemistry and functions of biomolecules and their digestion and absorption, and the general metabolic pathways as well as the metabolism of glucose, fatty acids and amino group of amino acids (The biomolecules which will be taught are the carbohydrates, lipids, amino acids and protein, nucleotides and nucleic acids, enzymes, vitamins and minerals).

2. Course Main Objective

The students can Know the

- ✚ Chemical structure and function of biomolecules and their digestion and absorption.
- ✚ General metabolic pathways including the krebs cycle and respiratory chain.
- ✚ Metabolism of glucose, fatty acids, and the amino group of the amino acids.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	To demonstrate knowledge of the fundamental concepts and principles of biochemistry including the chemistry and metabolism of biomolecules	K1, K2 and K3
1.2	To demonstrate understanding of the qualitative laboratory analysis of biomolecules	K3
1.3	To understand the structure and function relationship of biomolecules.	K1 and K2
2	Skills:	
2.1	To analyze, interpret and explain the structure-based mechanism of biomolecules and their reactions.	S1 and S4
3	Competence:	
3.1	To present an oral explanation for a subject in the area	C2 and C4
3.2	To interact positively with colleagues in a group work	C1 and C2

C. Course Content

No	List of Topics	Contact Hours
1	Course introduction, water, pH and buffers, carbohydrates chemistry and functions	4
2	Lipids chemistry and functions, amino acids and proteins chemistry and functions, and the chemistry and biological importance of nucleotides and nucleic acids	10
3	Enzymes, vitamins, and minerals	8
4	Digestion and absorption, glycolysis, krebs cycle, respiratory chain, glycogen metabolism, beta oxidation and urea cycle	8
	Total	30
Practical sessions		
1	pH and buffers	2
2	qualitative analysis of carbohydrates	4
3	qualitative analysis of lipids	4
4	qualitative analysis and separation of amino acids and proteins	6
5	extraction of DNA	2
6	Detection of enzymes	2
7	Measurement of glucose in a biological fluid	2
8	Measurement of vitamins in juice	4
9	Spectrophotometric determination of minerals in biological fluids	2
10	Discussion and oral exams	2
	Total of practical	30
Total		60

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		
1.1	To demonstrate knowledge of the fundamental concepts and principles of biochemistry including the chemistry and metabolism of biomolecules	<ul style="list-style-type: none"> Formal lectures practical sessions 	Written, practical and oral exams
1.2	To demonstrate understanding of the qualitative laboratory analysis of biomolecules		
1.3	To understand the structure and function relationship of biomolecules.		
2.0	Skills		
2.1	To analyze, interpret and explain the structure-based mechanism of biomolecules and their reactions.	<ul style="list-style-type: none"> Formal lectures practical sessions oral discussions 	Written, practical and oral exams
3.0	Competence		
3.1	To present an oral explanation for a subject in the area	<ul style="list-style-type: none"> Formal lectures practical sessions oral discussions 	Written, practical and oral exams
3.2	To interact positively with colleagues in a group work		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First test	5 th	5%
2	Second test	10 th	5%
3	Report	10 th	5%
4	Oral discussion	14 th	10%
5	Practical	14 th	25%
6	Final exam	15 th	50%

*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:

10 office hours are offered for students for individual consultations

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<p>1- هاربرز في الكيمياء الحيوية. تأليف: د. روبرت موراي وآخرون. ترجمة: د. عماد ابو عسلي. د. يوسف بركات. مراجعة: د. عماد عبد النبي. (2006). مركز تعريب العلوم الصحية- الكويت.</p> <p>1-Harpers in Biochemistry. Written by: Dr. Robert Murray et al. Translation: Dr. Emad Abu Asli, Dr. Youssef Barakat. Review: Dr.</p>
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	<p>Emad Abdul Nabi. (2006) Center for Arabization of Health Sciences – Kuwait.</p> <p>2- Murray, R. K., D. K. Grinner, and V. W. Rodwell. "Harper's Illustrated Biochemistry". 2007. Review book.</p> <p>3- اساس الكيمياء الحيوية العملية. أبو صلاح, خالد مصطفى (1996). دار الخريجي للنشر و التوزيع.</p> <p>3-foundations of practical biochemistry. Abu Salah, Khaled Mustafa (1996). Al-Kuaiji Publishing and Distribution House.</p>
Essential References Materials	Lehninger A. L., Nelson, D. L., and Cox. M.M. (2007). "Principal of Biochemistry", 4 edition, W. H. Freeman and company, New York.
Electronic Materials	<p>International Journals: Chemistry and Biodiversity, Phytochemistry, Planta Medica, Natural products Reports.</p> <p>http://www.rsc.org/ebooks/archive/free/BK9780854044900/BK9780854044900-00001.pdf</p>
Other Learning Materials	<p>1- Lehninger A. L., Nelson, D. L., and Cox. M.M. (2007). "Principal of Biochemistry", 4 edition, W. H. Freeman and company, New York.</p> <p>2- Stryer, L., W. H. Freeman and Company. (2012). "Biochemistry" 3rd edition. New York.</p> <p>3- Voet et al., "Fundamentals of Biochemistry: Life at the Molecular Level" (2013). Charlotte Pratt co. Singapore.</p>

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Well-equipped teaching rooms and labs.
Technology Resources (AV, data show, Smart Board, software, etc.)	Computer lab Data show and Internet Resource center
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Molecular models.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course delivery (teaching methods and assessment methods)	Students	Questionnaire
	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
	Program Leader	Meetings
Course contents (update)	Departmental Plan and curriculum committee; external reviewers	Reports and workshops
Quality of learning resources	External reviewers	Reports

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 counsel
Reference No.	1/22/142
Date	15-9-1442