

Republic of Yemen

Ministry of Higher Education & Scientific Research

Emirates International University



Faculty of Dentistry

Department of Basic science

Doctor of Dental Surgery

Course Specification of Biochemistry I

Course No. ()



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Review committee.

Head of the Department

Quality Assurance head

Dean of Faculty



I. Course Identification and General Information:					
1	Course Title:	Biochemistry I			
2	Course Code & Number:				
3	Credit Hours:	Credit Hours	Theory Hours		Lab. Hours
			Lecture	Exercise	
		3	2	--	2
4	Study Level/ Semester at which this Course is offered:	1 st Level / 2 nd Semester			
5	Pre –Requisite (if any):	General chemistry			
6	Co –Requisite (if any):	None			
7	Program (s) in which the Course is Offered:	Doctor of Dental Surgery			
8	Language of Teaching the Course:	English			
9	Study System:	Semester based System			
10	Mode of Delivery:	Full Time			
11	Location of Teaching the Course:	Faculty of Dentistry			
12	Prepared by:	Dr. Waled Al-Dubai			

II. Course Description:	
<p>This course records an outline of the molecular mechanisms fundamental to the life processes. Biochemistry I covers many topics including, structure, composition, classification, and importance of carbohydrates. lipids, proteins, vitamins and enzymes that provides students with basic information of biochemistry that help in identification the causes of many diseases. the student should be able to recognize the concepts of pH and buffering and types of solutions and define the basic structures of the major biochemical components, to understand the way in which their structure is related to function.</p>	

III. Course Intended Learning Outcomes (CILOs) Upon successful completion of the course, students will be able to:		Referenced PILOs Learning out of program	
A. Knowledge and Understanding:		I, A or E	
a1	Elucidate the composition of carbohydrates, lipids, proteins, and their importance	I	A1 Describe the scientific basis of dentistry and the relevant biomedical and behavioral sciences which form the basis for understanding human growth, development and health.
a2	Classify carbohydrates, lipids, proteins, vitamins and enzymes.	I	A1 Describe the scientific basis of dentistry and the relevant biomedical and behavioral sciences which form the basis for understanding human growth, development and health.
a3	Enumerate the causes and symptoms of biomolecules deficiency	I	A2 Explain the structure and function of the human body in health and disease related to the practice of dentistry.
B. Intellectual Skills:			
b1	Analyze the causes, and symptoms of diseases based on knowledge of carbohydrate, protein ,lipid vitamins, and enzymes chemistry.	I	B1 Incorporate theoretical basic biomedical, behavioral and dental sciences with the clinical signs and symptoms for appropriate understanding of disease and its management.
b2	Interpret abnormal biochemical tests results and analyze source of lab errors	I	B2 Apply critical thinking and evidence-based problem solving when providing patient's care.
C. Professional and Practical Skills:			

c1	Select suitable tests used in biochemistry lab	I	C1	Obtain and record a comprehensive history, perform an appropriate physical examination, and carry out different investigations to reach a correct diagnosis and treatment.
c2	Perform biochemical tests to identify and differentiate between carbohydrates, lipids, and proteins	I	C1	Obtain and record a comprehensive history, perform an appropriate physical examination, and carry out different investigations to reach a correct diagnosis and treatment.
c3	Perform lab experiments with great caution to avoid the hazards of chemical on him and his colleagues	I	C3	Apply infection control and radiation protection according to international standards.
D. Transferable Skills:				
d1	Use computer and internet to get information		D2	Use advanced information and communication technologies to enrich and diversify professional experience
d2	Work effectively alone and as part of a team		D3	Demonstrate leadership and teamwork skills with colleagues and other oral health team for effective delivery of oral health care.
d3	Demonstrate the skills required for self-learning to remain updated with dental practice.		D1	Commit to continuous education, self-development and lifelong learning to remain updated with advances in dental practice.

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies

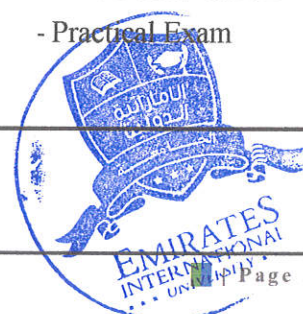
a1	Elucidate the composition of carbohydrates, lipids, proteins, and their importance	Lectures Presentation	-Quizzes -Midterm Exam -Final Exam
a2	Classify carbohydrates, lipids, proteins, vitamins and enzymes.	Lectures Presentation	-Quizzes -Midterm Exam -Final Exam
a3	Enumerate the causes and symptoms of biomolecules deficiency	Lectures Presentation	-Quiz -Midterm Exam -Final Exam

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
b1	Analyze the causes, and symptoms of diseases based on knowledge of carbohydrate, protein ,lipid vitamins, and enzymes chemistry.	-Lectures - Discussion	-Quizzes -Midterm Exam -Final Exam
b2	Interpret abnormal biochemical tests results and analyze source of lab errors	-Lectures - Discussion	-Practical Exam

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
c1	Select suitable tests used in biochemistry lab	-Lectures -Lab Experiments	-Practical Exam
c2	Perform biochemical tests to identify and differentiate between carbohydrates, lipids, and proteins	-Lectures -Lab Experiments	- Direct observation - Practical Exam
c3	Perform lab experiments with great caution to avoid the hazards of chemical on him and his colleagues	-Lectures -Lab Experiments	- Direct observation - Practical Exam



(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:			
Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
d1	Use computer and internet to get information	- Discussion - Self Learning - Presentation	Research Homework Group work Direct observation
d2	Work effectively alone and as part of a team	- Discussion - Self Learning - Presentation - Seminars	Research Homework Group work Direct observation
d3	Demonstrate the skills required for self-learning to remain updated with dental practice.	- Discussion - Self Learning - Presentation - Seminars	Research Homework Group work Direct observation

IV. Course Contents:					
A. Theoretical Aspect:					
No .	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	Carbohydrates Chemistry	-Biochemistry and medicine -Defenation and function of carbohydrates Classification of carbohydrates -Monosaccharides (classification, importance, properties) -Disaccharides (types, importance, properties) -Polysaccharides (classification, importance, properties)	3	6	a1,a2, a3 b1
2	Lipid chemistry	-Classification of lipids -Simple lipids and their importance -Compound lipids	3	6	a1,a2, a3 b1

No .	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
		-Phospholipids (types, structure, importance) -Lipoproteins (types, structure, importance) -Derived lipids (types, structure, importance)			
3	Midterm Exam	-MCQs and essay questions	1	2	a1,a2, a3 b1
4	Protein chemistry	-Definition and importance of proteins -Aminoacids (classification , structure, properties, importance) -Structure of proteins (primary, secondary, tertiary, quaternary) -Classification of proteins with examples	4	8	a1,a2, a3 b1
5	Vitamins and Enzymes	-Definition and classification of vitamins -Fat soluble vitamins and Water soluble vitamins (sources, structure, active forms, absorption, storage, stability, functions, deficiency and clinical manifestation , toxicity). -Definition and classification of enzymes -Cofactors -Mechanism of enzyme action -Factors that affect the rate of enzyme action -Enzymes inhibitors and isoenzymes -Clinical application of enzymes	4	8	a2, a3 b1
6	Final Exam	-MCQs and essay questions	1	2	a1,a2, a3 b1
Number of Weeks /and Units Per Semester			16	32	

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Week Due	Contact Hours	Learning Outcomes (CILOs)
1	Introduction to lab safety	3 rd ,4 th *	4	c3
2	-Identification of carbohydrates: Molisch's test, Iodine test, Barfoed's test Benedict's test, Seliwanoff's test Carbohydrate scheme tests	5 th ,6 th ,7 th	6	b2,c1,c2,c3
3	-Protein identification: Biuret test, Isoelectricpoint test, Heat and acid tests Proteins Scheme tests.	8 th ,9 th ,10 th	6	b2,c1,c2,c3
4	-Lipid identification tests: Test for solubility, Suden IV, Salkowski reaction, Dichromate test	11 th ,12 th ,13 th	6	b2,c1,c2,c3
5	- practical Exam	15 th	2	b2,c1,c2,c3
Number of Weeks /and Units Per Semester		12	24	

V. Teaching Strategies of the Course:

- Lectures
- Discussion
- Self-Learning
- Presentation
- Seminars
- Lab Experiments

VI. Assessment Methods of the Course:

- Quizzes
- Midterm Exam
- Final Exam
- Practical Exam
- Research

- Homework
- Group work
- Direct observation

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignment : Searching information about related subjects of biochemistry	10 th	5	d1,d2,d3
Total			5	

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	10 th	5	5 %	d1,d2,d3
2	Quizzes	4 th	5	5 %	a1,a2, a3 b1
3	Midterm Exam	7 th	20	20 %	a1,a2, a3 b1
4	Practical Exam	15 th	20	20 %	b2,c1,c2,c3
5	Final Exam	16 th	50	50 %	a1,a2, a3 b1
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two):

- 1- Victor, R.W., David, A.B., Kathleen, M.B., Peter, j. k., Anthony, P.W (2012). Harper's Illustrated Biochemistry.29st edn. United States : McGraw-Hill Education
- 2- Al-Dubai W

3- .Medical biochemistry (part 1). 2nd ed.Yemen:Dar Althakafa Al-asreeia
2- Essential References:
1- -David, L. N., Michael, M. C (2013) Lehninger principles of biochemistry.6th edn. England: Macmillan Higher Education.
2- -Michael, L., Alisa, P (2014) Marks' Essentials of Medical Biochemistry: A Clinical Approach. 2 nd edn. China: Wolters Kluwer.
3- Electronic Materials and Web Sites etc.:
Websites:
1- Biochemistry Courses https://www.edx.org/learn/biochemistry
2- Biochemistry: Free For All https://open.umn.edu/opentextbooks/textbooks/biochemistry-free-for-all-ahern

X. Course Policies: (Based on the Uniform Students' By law (2007))	
1	Class Attendance: Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	Tardiness: A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	Exam Attendance/Punctuality: No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	Assignments & Projects: Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	Cheating: Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	Forgery and Impersonation: Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.

7	<p>Other policies:</p> <p>The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.</p>
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Faculty of Dentistry

Department of Basic science

Doctor of Dental Surgery

Course Plan (Syllabus) of Biochemistry I

Course No. ()

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member:	Waled Al-Dubai	Office Hours					
Location & Telephone No.:	Sana'a 733872358	4 Hours Weekly					
		1	1		1		1
E-mail:	walidw2001@yahoo.com	SAT	SUN	MON	TUE	WED	THU



II. Course Identification and General Information:					
1	Course Title:	Biochemistry I			
2	Course Code & Number:				
3	Credit Hours:	Credit Hours	Theory Hours		Lab. Hours
			Lecture	Exercise	
		3	2	--	2
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5	Pre –Requisite (if any):	General chemistry			
6	Co –Requisite (if any):	None			
7	Program (s) in which the Course is Offered:	Doctor of Dental Surgery			
8	Language of Teaching the Course:	English			
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<p>This course records an outline of the molecular mechanisms fundamental to the life processes. Biochemistry I covers many topics including, structure, composition, classification, and importance of carbohydrates, lipids, proteins, vitamins and enzymes that provides students with basic information of biochemistry that help in identification the causes of many diseases. The student should be able to recognize the concepts of pH and buffering and types of solutions and define the basic structures of the major biochemical components, to understand the way in which their structure is related to function.</p>

IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

A. Knowledge and Understanding:	
a1	Elucidate the composition of carbohydrates, lipids, proteins, and their importance
a2	Classify carbohydrates, lipids, proteins, vitamins and enzymes.
a3	Enumerate the causes and symptoms of biomolecules deficiency
B. Intellectual Skills:	
b1	Analyze the causes, and symptoms of diseases based on knowledge of carbohydrate, protein, lipid, vitamins, and enzymes chemistry.
b2	Interpret abnormal biochemical tests results and analyze source of lab errors
C. Professional and Practical Skills:	
c1	Select suitable tests used in biochemistry lab
c2	Perform biochemical tests to identify and differentiate between carbohydrates, lipids, and proteins
c3	Perform lab experiments with great caution to avoid the hazards of chemical on him and his colleagues
D. Transferable Skills:	
d1	Use computer and internet to get information
d2	Work effectively alone and as part of a team
d3	Demonstrate the skills required for self-learning to remain updated with dental practice.

V. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	Carbohydrates Chemistry	-Biochemistry and medicine -Defenation and function of carbohydrates	3	6

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
		Classification of carbohydrates -Monosaccharides (classification, importance, properties) -Disaccharides (types, importance, properties) -Polysaccharides (classification, importance, properties)		
2	Lipid chemistry	-Classification of lipids -Simple lipids and their importance -Compound lipids -Phospholipids (types, structure, importance) -Lipoproteins (types, structure, importance) -Derived lipids (types, structure, importance)	3	6
3	Midterm Exam	-MCQs and essay questions	1	2
4	Protein chemistry	-Definition and importance of proteins -Aminoacids (classification , structure, properties, importance) -Structure of proteins (primary, secondary, tertiary, quaternary) -Classification of proteins with examples	4	8
5	Vitamins and Enzymes	-Definition and classification of vitamins -Fat soluble vitamins and Water soluble vitamins (sources, structure, active forms, absorption, storage, stability, functions, deficiency and clinical manifestation , toxicity). -Definition and classification of enzymes -Cofactors -Mechanism of enzyme action -Factors that affect the rate of enzyme action -Enzymes inhibitors and isoenzymes	4	8

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
		-Clinical application of enzymes		
6	Final Exam	-MCQs and essay questions	1	2
Number of Weeks /and Units Per Semester			16	32

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Week Due	Contact Hours
1	Introduction to lab safety	3 rd ,4 th *	4
2	-Identification of carbohydrates: Molisch's test, Iodine test, Barfoed's test Benedict's test, Seliwanoff's test Carbohydrate scheme tests	5 th ,6 th ,7 th	6
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4	-Lipid identification tests: Test for solubility, Sudan IV, Salkowski reaction, Dichromate test	11 th ,12 th ,13 th	6
5	- practical Exam	15 th	2
Number of Weeks /and Units Per Semester		12	24

VI. Teaching Strategies of the Course:

- Lectures
- Discussion
- Self-Learning
- Presentation
- Seminars

- Lab Experiments

VII. Assessment Methods of the Course:

- Quizzes
- Midterm Exam
- Final Exam
- Practical Exam
- Research
- Homework
- Group work
- Direct observation

VIII. Assignments:

No.	Assignments	Week Due	Mark
1	Assignment : Searching information about related subjects of biochemistry	10th	5
Total			5

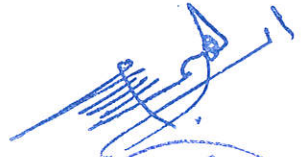
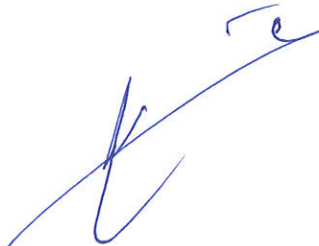
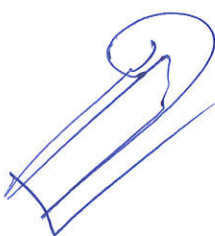
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