



# Course Specifications

<b>Course Title:</b>	<b>Biochemistry (BCH113)</b>
<b>Course Code:</b>	<b>MDS 113</b>
<b>Program:</b>	<b>Bachelor of Dentistry [ BDS ]</b>
<b>Department:</b>	<b>Basic Science department.</b>
<b>College:</b>	<b>College of Dentistry</b>
<b>Institution:</b>	<b>Majmaah University</b>

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## A. Course Identification

<b>1. Credit hours:3</b> (1+2+0)
<b>2. Course type</b> 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"/>
<b>3. Level/year at which this course is offered:</b> 1 <sup>st</sup> Year / 1 <sup>st</sup> and 2 <sup>nd</sup> Semester
<b>4. Pre-requisites for this course (if any):</b> NA
<b>5. Co-requisites for this course (if any):</b> NA

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	40%
2	Blended	NA	NA
3	E-learning	NA	NA
4	Correspondence	NA	NA
5	Other - Laboratory	45	60%

### 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	15
2	Laboratory/Studio	60
3	Tutorial	-
4	Others (specify)	-
	<b>Total</b>	<b>75</b>
<b>Other Learning Hours*</b>		
1	Study	45
2	Assignments	15
3	Library	15
4	Projects/Research Essays/Theses	-
5	Others(specify)	-
	<b>Total</b>	<b>75</b>

\*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

This is a one year course that consists of two parts, theoretical lectures in first semester and practical sessions in both first and second semester. Biochemistry course deals with structure and properties of biomolecules, such as amino acids, proteins, carbohydrates, lipids, and nucleic acids. The focus of this course will be on the relationship between protein structure and its biological function, generation and storage of metabolic energy, main metabolic pathways and their key steps. In addition, the role of phospholipids in determining the properties of biological membranes and their function will be discussed. The principal objective of the course is for students to acquire knowledge and understanding of current concepts in the subject of the course and to develop critical thinking skills.

### 2. Course Main Objective

This course is dealing with structure and properties of biomolecules, such as amino acids, proteins, carbohydrates, lipids and nucleic acids and their pathways inside the body.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge:</b>	
K1.3	Describe the basic types and structure of biomolecules and its importance	K1
K3.3	Describe the various metabolic pathways and its regulatory mechanisms	K3
<b>2</b>	<b>Skills :</b>	
S1.3	Explain the normal and abnormal biochemical processes in health and diseases and various biochemical estimations.	S1
<b>3</b>	<b>Competence:</b>	
C2.2	Demonstrate cooperation, good communication and coordination with fellow colleagues to submit a group task or assignments	C2

## C. Course Content

No	List of Topics	Contact Hours
1	Introduction to biochemistry , importance of water and the bonds formed between biomolecules , pH, biological buffers	1
2	Amino acids, peptides and proteins, structure, properties and functions	1
3	Enzymes, Co-Enzymes and Co-factors	1
4	Structure of carbohydrate and metabolism	1
5	Cycle and oxidative phosphorylation of biomolecules (electron transport system)	1
6	Structure and metabolism of lipids and steroids	3
7	Bio-membranes	1
8	Nutrition, amino acid metabolism, transamination, urea cycle	1
9	Protein biosynthesis, role of DNA and the genetic code	1

10	Blood bio-chemistry, hemoglobin, plasma proteins and immunoglobulins	1
11	Control and integration of metabolism ( homeostasis )	1
12	Calcium and phosphorus metabolism	1
13	Bio-chemistry of bone , cementum and enamel	1
<b>First semester practical</b>		
1	Introduction - Principles to clinical chemistry, related to health and disease	2
2	Automation	4
3	Estimation of serum glucose	2
4	Glucose tolerance test	4
5	Estimation of serum calcium	2
6	Estimation of serum phosphorus	2
7	Estimation of serum magnesium	2
8	Estimation of serum cholesterol	2
9	Estimation of serum triglycerides	2
10	Estimation of serum HDL and LDL Cholesterol	4
11	Estimation of liver function parameter	2
<b>SECOND SEMESTER (PRACTICAL)</b>		
1	Clinical biochemistry and diseases	2
2	Case study of diabetic patient	5
3	Estimation of Glycosylated Haemoglobin	5
4	Case study of Renal failure disease	5
5	Case study of Liver diseases	5
6	Case study of Cardiac failure	5
7	Interpretation of lab results	3

## D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1</b>	<b>Knowledge</b>		
K1.3	Describe the basic types and structure of biomolecules and its importance	Lectures Group discussions Practical/Lab	Written exams , Oral evaluations, Quiz, weekly assessment, OSPE and Assignments
K3.3	Describe the various metabolic pathways and its regulatory mechanisms	Lectures Group discussions Practical/Lab	Written exams , Oral evaluations, Quiz, weekly assessment, OSPE, Assignments
<b>2</b>	<b>Skills</b>		
S1.3	Explain the normal and abnormal biochemical processes in health and diseases and various biochemical estimations.	Lectures Group discussions Practical/Lab	Written exams , Oral evaluations, Quiz, OSPE, Assignments, weekly assessments
<b>3</b>	<b>Competence</b>		
C2.2	Demonstrate cooperation, good communication and coordination with fellow colleagues to submit a group task or assignments	Practical/Lab Group Discussion	The group task / Assignment work supervised closely and the

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			work done by each student evaluated using rubrics in weekly assessment, assignments.

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1 + 2	Week 10 & Week 19	05%
2	Midyear exam – Theory	Week 14	15%
3	Behavior / Professionalism	During the course	05%
4	Assignment	During the course	05%
5	Weekly Assessment	During the course	30%
6	Final Practical Exam	Week 14	25%
v	Final Theory Exam	Week 16	15%

\*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 :**

The student shall avail the consultancy during the displayed office hours

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	✓ Textbook of biochemistry, Thomas M. Devlin, John Wiley & Sons, Inc, 7Th ed., 2010.
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>✓ Clinical Chemistry, William J Marshall and Stephen K Bangert, Elsevier, 2008..Maji jose – Textbook of oral biology.</li> <li>✓ Journal of medical biochemistry.</li> <li>✓ Journal of clinical biochemistry.</li> <li>✓ Journal of applied biochemistry.</li> </ul>
<b>Electronic Materials</b>	<p>www.pubmed.com.</p> <p>Mohammad Rashad site in the Majmaah university site (mu.edu.sa)  <a href="http://faculty.mu.edu.sa/m.rashad">http://faculty.mu.edu.sa/m.rashad</a></p>
<b>Other Learning Materials</b>	None

### 2. Facilities Required

Item	Resources
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Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> <li>✓ Lecture room suitable for 30 students</li> <li>✓ Fully equipped lab for practical sessions</li> </ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>✓ Projector</li> <li>✓ Smart board with all the accessories</li> <li>✓ Internet</li> </ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>✓ Microscopes</li> <li>✓ Microscopic slides</li> <li>✓ Soft tissues specimens and casts of oral structures</li> </ul>

### G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	<ul style="list-style-type: none"> <li>✓ Course Evaluation Survey</li> <li>✓ Quality of Exam Survey</li> </ul>
	Faculty	<ul style="list-style-type: none"> <li>✓ CLO Mapping with teaching &amp; assessment.</li> <li>✓ Course Blueprinting</li> <li>✓ Grade Analysis</li> <li>✓ Psychometric Analysis</li> </ul>
	Peers	Grade Verification
Extent of achievement of course learning outcomes	Faculty member / Quality assurance committee	<ul style="list-style-type: none"> <li>✓ Direct assessment outcome analysis</li> <li>✓ Course report preparation</li> </ul>
Quality of learning resources, etc	Students / Faculty	<ul style="list-style-type: none"> <li>✓ Academic advising survey</li> <li>✓ Student experience survey</li> </ul>

**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

<b>Council / Committee</b>	<b>Department Council</b>
<b>Reference No.</b>	*****
<b>Date</b>	*****