



# Course Specifications

<b>Course Title:</b>	<b>Medical Chemistry (2)</b>
<b>Course Code:</b>	<b>370212-4</b>
<b>Program:</b>	<b>Bachelor's in Clinical Laboratory Sciences (Level-7)</b>
<b>Department:</b>	<b>Clinical Laboratory Sciences</b>
<b>College:</b>	<b>Applied Medical Sciences</b>
<b>Institution:</b>	<b>Taif University</b>



## Table of Contents

<b>A. Course Identification</b> .....	<b>3</b>
6. Mode of Instruction (mark all that apply) .....	3
<b>B. Course Objectives and Learning Outcomes</b> .....	<b>4</b>
1. Course Description .....	4
2. Course Main Objective .....	4
3. Course Learning Outcomes .....	4
<b>C. Course Content</b> .....	<b>4</b>
<b>D. Teaching and Assessment</b> .....	<b>5</b>
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods.....	6
2. Assessment Tasks for Students .....	6
<b>E. Student Academic Counseling and Support</b> .....	<b>7</b>
<b>F. Learning Resources and Facilities</b> .....	<b>7</b>
1. Learning Resources .....	7
2. Facilities Required .....	7
<b>G. Course Quality Evaluation</b> .....	<b>8</b>
<b>H. Specification Approval Data</b> .....	<b>8</b>

## A. Course Identification

<b>1. Credit hours:</b> 4
<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> Level 2/First year
<b>4. Pre-requisites for this course (if any):</b> Medical chemistry (1) (370112-3)
<b>5. Co-requisites for this course (if any):</b> None

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

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5 hours /week= 75 hours/semester	100%
2	Blended	None	0%
3	E-learning	None	0%
4	Correspondence	None	0%
5	Other	None	0%

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

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	45
2	Laboratory/Studio	30
3	Tutorial	None
4	Others (specify)	None
	<b>Total</b>	<b>75 hours</b>
<b>Other Learning Hours*</b>		
1	Study	48
2	Assignments	4
3	Library	None
4	Projects/Research Essays/Theses	None
5	Others (specify)	2hour demonstration on popular databases (e.g. PubMed and SDL)
	<b>Total</b>	<b>54 hours</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

The main purpose of the course is to provide learners with the fundamental biochemical background about the compounds of life which includes carbohydrates, proteins and amino acids, lipids, enzymes, nucleic acids, vitamins, and minerals. They will also learn about the structure and classifications of these compounds and their biological functions and roles at the cellular level.

### 2. Course Main Objective

The main objective of this course is to make students understand the basics of major biomolecules such as carbohydrates, lipids, and proteins. These include structure, classification, chemical reactions, different types of chemical bonds, nomenclature, and biological functions.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge:</b>	
1.1	Identify the chemical structure, classification, properties and function of carbohydrates, lipids, proteins and nucleic acids as well as their primary structural units.	K1
1.2	Describe the isomerism and biological functions of some individual sugars, fatty acids and amino acids.	K1
1.3	Describe the various vitamins and minerals, and their sources, absorption, transport, and function.	K1
1.4	Identify principles of basic biochemical laboratory tests such as those for proteins, carbohydrates and lipids.	K2
2	<b>Skills :</b>	
2.1	Analyze basic biochemical reactions and correlate these with the laboratory findings.	S2
3	<b>Competence:</b>	
None		

### C (a) Course Content (Theory)

No	List of Topics	Contact Hours
1	<ul style="list-style-type: none"> <li>▪ <b>Module 1: Carbohydrates</b> <ul style="list-style-type: none"> <li>• Introduction to carbohydrates</li> <li>• Classification of monosaccharides</li> <li>• Common monosaccharides</li> </ul> </li> </ul>	9

	<ul style="list-style-type: none"> <li>• Monosaccharides reactions and derivatives</li> <li>• Oligosaccharides and polysaccharides</li> </ul>	
2	<ul style="list-style-type: none"> <li>▪ <b>Module 2: Lipids</b> <ul style="list-style-type: none"> <li>• Introduction to lipids</li> <li>• Classification of lipids</li> <li>• Fatty acids structure and properties</li> <li>• Reactions of fatty acids</li> <li>• Glyceride and non-glyceride lipids</li> <li>• Biomembranes</li> </ul> </li> </ul>	9
3	<ul style="list-style-type: none"> <li>▪ <b>Module 3: Proteins and amino acids</b> <ul style="list-style-type: none"> <li>• Introduction to proteins and amino acids</li> <li>• Biological importance of proteins</li> <li>• Amino acids classification, properties, and reactions</li> <li>• Important peptides</li> <li>• Proteins structure and classifications</li> </ul> </li> </ul>	9
4	<ul style="list-style-type: none"> <li>▪ <b>Module 4: Enzymes</b> <ul style="list-style-type: none"> <li>• Introduction to enzymology</li> <li>• Enzymes mechanism of action</li> <li>• Factors affecting enzyme activity</li> <li>• Enzyme activity regulations</li> <li>• Enzyme inhibition</li> <li>• Importance of enzymes in clinical diagnoses</li> </ul> </li> </ul>	6
5	<ul style="list-style-type: none"> <li>▪ <b>Module 5: Nucleic acids</b> <ul style="list-style-type: none"> <li>• Nucleotides structure and function</li> <li>• DNA structure and properties</li> <li>• RNA structure and properties</li> </ul> </li> </ul>	3
6	<ul style="list-style-type: none"> <li>▪ <b>Module 6: Vitamins &amp; Minerals</b> <ul style="list-style-type: none"> <li>• Classification</li> <li>• Functions and metabolism</li> <li>• Vitamins/minerals deficiency and associated disorders</li> </ul> </li> </ul>	9
<b>Total</b>		45

### (b) Course Content (Practical)

No	List of Topics	Contact Hours
1	Lab Safety	2
2	Glassware used in biochemistry lab	2
3	Qualitative reactions of carbohydrates	6
4	Qualitative reactions of lipids	4
5	Qualitative reactions of proteins	4
6	Enzyme activity	4
7	Principles of electrophoresis	4
8	Revision	4
<b>Total</b>		30

## 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	<b>Knowledge</b>		
1.1	Identify the chemical structure, classification, properties and function of carbohydrates, lipids, proteins and nucleic acids as well as their primary structural units.	<ul style="list-style-type: none"> <li>Lecture</li> </ul>	<ul style="list-style-type: none"> <li>Exam</li> </ul>
1.2	Describe the isomerism and biological functions of some individual sugars, fatty acids and amino acids.	<ul style="list-style-type: none"> <li>Lectures</li> </ul>	<ul style="list-style-type: none"> <li>Exams</li> </ul>
1.3	Describe the various vitamins and minerals and their sources, absorption, transport, and function.	<ul style="list-style-type: none"> <li>Lectures</li> </ul>	<ul style="list-style-type: none"> <li>Exams</li> <li>Assignments</li> </ul>
1.4	Identify principles of basic biochemical laboratory tests such as those for proteins, carbohydrates and lipids.	<ul style="list-style-type: none"> <li>Practical sessions</li> <li>Lectures</li> </ul>	<ul style="list-style-type: none"> <li>Lab reports</li> <li>Exam</li> </ul>
2.0	<b>Skills</b>		
2.1	Analyze basic biochemical reactions and correlate these with the laboratory findings.	<ul style="list-style-type: none"> <li>Lectures</li> <li>Practical sessions</li> <li>Problem based learning</li> </ul>	<ul style="list-style-type: none"> <li>Exams</li> <li>OSPE</li> </ul>
3.0	<b>Competence</b>		
	None		

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	8 <sup>th</sup> Week	15%
2	Quiz	12 <sup>th</sup> Week	5%
3	Practical Report	Throughout the semester	10%
4	Final Practical Exam	15 <sup>th</sup> Week	20%
5	Final Exam	16 <sup>th</sup> /17 <sup>th</sup> Week	50%
6	<b>Total</b>		<b>100%</b>

\*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 :

- Course instructors are available for individual consultation in their free time. They are usually full-time permanent members present on-campus from 8:00 am to 2:30 pm on all working days. Appointments can be made in person with the instructor through email etc. Days and time availability of each instructor are posted on their doors. Course instructors provide a range of academic and course management advice including course planning and its progression.
- Each student at the department of Clinical Laboratory Sciences has an academic adviser who is available for individual consultation and guidance. Appointments can be made in person with the instructor through email etc. Days and time availability of each adviser are posted on their doors. The academic adviser can provide support with time management, exam preparation, clarification of subject requirements, feedback on performance and dealing with personal issues as well.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>- Ferrier, D.R. (2017). Lippincott's Illustrated Reviews, (5<sup>th</sup> or 6<sup>th</sup> or 7<sup>th</sup> edition), Wolter Kluwer, Philadelphia.</li> <li>- Devlin, T.M. (2015). Textbook of Biochemistry with Clinical Correlations, 7<sup>th</sup> edition, John Wiley and Sons.</li> </ul>
<b>Essential References Materials</b>	N/A
<b>Electronic Materials</b>	SDL: <a href="https://sdl.edu.sa/SDLPortal/en/Publishers.aspx">https://sdl.edu.sa/SDLPortal/en/Publishers.aspx</a> PubMed: <a href="https://www.ncbi.nlm.nih.gov/pubmed/">https://www.ncbi.nlm.nih.gov/pubmed/</a>
<b>Other Learning Materials</b>	N/A

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms and Laboratories
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show, Blackboard and A/V
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	- Laboratory should be stocked with all necessary consumable materials (chemicals, reagents, kits, gloves. etc).

Item	Resources
	<ul style="list-style-type: none"> <li>- All safety materials, tools, and regulations must be available and applied appropriately.</li> <li>- Necessary laboratory equipment should be available such as fridge, spectrophotometry, pipettes, pH meter glass ware. etc.</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student's feedback on effectiveness of teaching and quality of courses.	Students	Indirect: Questionnaire Survey at the end of each semester.
Alignment map of course ILOs with that of program ILOs.	Development and accreditation committee	Direct: Student's Performance.
Availability of learning resources, facilities and equipments related to each course.	Students and faculty	Indirect: Questionnaire Survey at the end of each semester.
Evaluation of teaching	Peer evaluators	Direct: Peer evaluation
Standard of student achievement	Examination Committee	Direct: Students grades
Periodical review of course effectiveness and planning for its improvement.	Teaching staff/ Development and accreditation committee	Indirect: Review by Department Committee

**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
Reference No.	Meeting No.10
Date	10-9-1440