



## Course Specifications

<b>Course Title:</b>	<b>Medical Biology (2)</b>
<b>Course Code:</b>	<b>370211-4</b>
<b>Program:</b>	<b>Bachelor in Clinical Laboratory Sciences; Level-6 (Program Code: 373000)</b>
<b>Department:</b>	<b>Clinical Laboratory Sciences Department</b>
<b>College:</b>	<b>College of Applied Medical Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 4 Hours (3 T + 1 P)
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 2 <sup>nd</sup> Level/ First Year
<b>4. Pre-requisites for this course</b> (if any): Medical Biology-1/ 370111-4
<b>5. Co-requisites for this course</b> (if any): None

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

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5 hours /week= 50 hours/semester	62.5%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	3 hours /week= 30 hours/semester	37.5%

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	50
2	Laboratory/Studio	30
3	Tutorial	N/A
4	Others (specify)	NA
	Total	80 Hours

## B. Course Objectives and Learning Outcomes

<b>1. Course Description</b>
The Medical Biology (2) course provides an overview of terms, structure and function of body systems.

## **2. Course Main Objective**

This course provides an overview of the structure and function of different human body systems. The main goal of this course is to help the students to understand the anatomy and physiology of body systems such as respiratory, urinary, skeletal etc, and relate how the activities of the systems are integrated to form a functional whole.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding:</b>	
<b>1.1</b>	Recognize the structure and function of different human body systems.	K1
<b>1.2</b>	Define the basic anatomy and physiology of body systems, and relate how the activities of the systems are integrated to form a functional whole.	K1
<b>1.3</b>	Identify the basic types of blood cells and relate with their normal values.	K1
<b>2</b>	<b>Skills:</b>	
<b>2.1</b>	Analyse the blood components and blood groups on micrograph pictures.	S1
<b>3</b>	<b>Values:</b>	
None		

### C. Course Content

#### 1. Theory

No	List of Topics Physiology Part	Contact Hours	List of Topics Anatomy Part	Contact Hours
1	Introduction & Blood (Presentation)	3	Introduction	2
2	Cardio Vascular System (CVS) (Presentation)	3	Bone, joints, skin, fascia & muscles.	2
3	Respiratory system (Presentation)	3	CVS	2
4	Gastro Intestinal Tract (GIT) (Presentation)	3	Respiratory	2
5	Urinary system (Presentation)	3	GIT	2
6	Nervous system (Presentation)	3	Urinary	2
7	Male Reproduction system (Presentation)	3	Lymphatic system	2
8	Female Reproduction system (Presentation)	3	Nervous system 1	2
9	Endocrinology system (Presentation)	3	Male genital system	2
10	Muscle & nerve (Presentation)	3	Female genital system	2
<b>Total</b>		<b>50</b>		

## 2. Practical

No	List of Topics	Contact Hours
1	Introduction to Organization of the Human Body and major organ system of the human body (Lab Manual + Presentation)	3
2	Introduction to Blood components (Lab Manual + Presentation)	3
3	Identification and calculation of Red blood cells (Lab Manual + Presentation)	3
4	Identification and calculation of white blood cells (WBCs) (Lab Manual + Presentation)	3
5	Blood grouping (Lab Manual + Presentation)	3
6	Circulatory system (Lab Manual + Presentation)	3
7	Skeletal system (Lab Manual + Presentation)	3
8	Urinary system (Lab Manual + Presentation)	3
9	Digestive system (Lab Manual + Presentation)	3
10	Nervous system (Lab Manual + Presentation)	3
<b>Total</b>		<b>30</b>

## 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 and Understanding:</b>		
1.1	Recognize the structure and function of different human body systems.	Lectures	Written Exams
1.2	Define the basic anatomy and physiology of body systems, and relate how the activities of the systems are integrated to form a functional whole.	Lectures	Written Exams
1.3	Identify the basic types of blood cells and relate with their normal values.	Lectures	Written Exams
2.0	<b>Skills:</b>		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	Analyse the blood components and blood groups on micrograph pictures.	<ul style="list-style-type: none"> <li>Practical Sessions</li> </ul>	<ul style="list-style-type: none"> <li>Practical Exam</li> </ul>
3.0	Values:		
None			

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	5 <sup>th</sup> week	20%
2	Activity (Online quiz 1 & 2)	Throughout	10%
3	Final Practical Exam	11 <sup>th</sup> week	20%
4	Final Exam	12 <sup>th</sup> /13 <sup>th</sup> week	50%
<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>Principles of Anatomy and Physiology (2016), Gerard J. Tortora and Bryan. H. Derrickson, 15<sup>th</sup> Edition, Wiley Publishers, ISBN: 978-1-119-32064-7.</li> <li>Cell Biology and Histology (2014), Leslie P. Gartner and James L. Hiatt, 7th edition, Wolters Kluwer Publications, ISBN: 9781451189513.</li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>Websites, Search engines (Saudi Digital Library, PubMed, Google Scholar)</li> </ul>
<b>Other Learning Materials</b>	<ul style="list-style-type: none"> <li>Saudi digital library</li> </ul>

### 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)	None

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student's feedback on effectiveness of teaching.	<ul style="list-style-type: none"> <li>Students</li> </ul>	<ul style="list-style-type: none"> <li><b>Indirect:</b> Questionnaire Survey at the end of each semester.</li> </ul>
Quality of learning resources (laboratory and library) related to each course.	<ul style="list-style-type: none"> <li>Students</li> <li>Staff members</li> </ul>	<ul style="list-style-type: none"> <li><b>Indirect:</b> Questionnaire Survey at the end of each semester related to learning resources.</li> </ul>
Evaluation of teaching	<ul style="list-style-type: none"> <li>Peer evaluators</li> </ul>	<ul style="list-style-type: none"> <li><b>Indirect:</b> Peer evaluation</li> </ul>



Evaluation Areas/Issues	Evaluators	Evaluation Methods
Evaluation of exam quality and assessment.	<ul style="list-style-type: none"> <li>Exam committee</li> <li>Students</li> </ul>	<ul style="list-style-type: none"> <li><b>Direct:</b> Exam paper/ exam blueprint review</li> <li><b>Indirect:</b> Questionnaire Survey at the end of each semester.</li> </ul>
Achievement of course learning outcomes	<ul style="list-style-type: none"> <li>Course Coordinators</li> <li>Development and accreditation committee</li> </ul>	<ul style="list-style-type: none"> <li><b>Direct:</b> Student's Performance assessed through item analysis and rubrics.</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>	Department Council
<b>Reference No.</b>	Meeting Number 11
<b>Date</b>	19/05/2022





## Course Specifications

<b>Course Title:</b>	<b>Medical Chemistry (2)</b>
<b>Course Code:</b>	<b>370212-4</b>
<b>Program:</b>	<b>Bachelor in Clinical Laboratory Sciences; Level-6 (Program Code: 373000)</b>
<b>Department:</b>	<b>Clinical Laboratory Sciences Department</b>
<b>College:</b>	<b>College of Applied Medical Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 4 Hours (3 T + 1 P)
<b>2. Course type</b> a. University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others     b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 2 <sup>nd</sup> Level/ 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= 50 hours/semester	62.5%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	3 hours /week= 30 hours/semester	37.5%

## 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	50
2	Laboratory/Studio	30
3	Tutorial	N/A
4	Others (specify)	NA
	<b>Total</b>	<b>80 Hours</b>

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

### C. Course Content

#### 1. Theory

No	List of Topics	Contact Hours
<b>1</b>	<b>Module 1: Carbohydrates (Presentation)</b> <ul style="list-style-type: none"> <li>• Introduction to carbohydrates</li> <li>• Classification of monosaccharides</li> <li>• Common monosaccharides</li> <li>• Monosaccharides reactions and derivatives</li> <li>• Oligosaccharides and polysaccharides</li> </ul>	<b>10</b>
<b>2</b>	<b>Module 2: Lipids (Presentation)</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>• Bio-membranes</li> </ul>	<b>10</b>
<b>3</b>	<b>Module 3: Proteins and amino acids (Presentation and Book Chapter No. 1, Pages 1-5)</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> </ul>	<b>10</b>

	<ul style="list-style-type: none"> <li>Proteins structure and classifications</li> </ul>	
4	<b>Module 4: Enzymes (Presentation)</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>	6
5	<b>Module 5: Nucleic acids (Presentation)</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>	4
6	<b>Module 6: Vitamins &amp; Minerals (Presentation)</b> <ul style="list-style-type: none"> <li>Classification</li> <li>Functions and metabolism</li> <li>Vitamins/minerals deficiency and associated disorders</li> </ul>	10
<b>Total</b>		<b>50</b>

## 2. Practical

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

## 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>1.0</b>	<b>Knowledge and Understanding:</b>		
<b>1.1</b>	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>Lectures</li> </ul>	<ul style="list-style-type: none"> <li>Written Exams</li> </ul>
<b>1.2</b>	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>Written Exams</li> </ul>
<b>1.3</b>	Recall 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>Written Exams</li> </ul>
<b>1.4</b>	State principles of basic biochemical laboratory tests such as those for proteins, carbohydrates and lipids.	<ul style="list-style-type: none"> <li>Lecture</li> <li>Practical Session</li> </ul>	<ul style="list-style-type: none"> <li>Written Exam</li> <li>Practical Exam</li> </ul>
<b>2.0</b>	<b>Skills:</b>		
<b>2.1</b>	Analyze basic biochemical reactions and correlate these with the laboratory findings.	<ul style="list-style-type: none"> <li>Lectures</li> <li>Practical sessions</li> </ul>	<ul style="list-style-type: none"> <li>Written Exam</li> <li>Objective Structured Practical Examination (OSPE)</li> </ul>
<b>3.0</b>	<b>Values:</b>		
<b>None</b>			

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
<b>1</b>	Mid-Term Exam	5 <sup>th</sup> Week	20%
<b>2</b>	Activity (quiz)	Throughout	10%
<b>3</b>	Practical Assessment (quiz)	Throughout	10%
<b>4</b>	Final Practical Exam	11 <sup>th</sup> Week	10%
<b>5</b>	Final Exam	12 <sup>th</sup> Week	50%
<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>• Denise R. Ferrier. Lippincott's Illustrated Reviews: Biochemistry (2014) 6<sup>th</sup> Edition, Wolter Kluwer Health Publishers (Philadelphia), ISBN Number: 978-1-4511-7562-2.</li></ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"><li>• CLS Program's Lab Manual of Medical Chemistry (2)</li></ul>
<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>	<ul style="list-style-type: none"><li>• None</li></ul>



## 2. Facilities Required

Item	Resources
<p><b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)</p>	<ul style="list-style-type: none"> <li>Classrooms and Laboratories</li> </ul>
<p><b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)</p>	<ul style="list-style-type: none"> <li>Data Show, Blackboard and A/V</li> </ul>
<p><b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)</p>	<ul style="list-style-type: none"> <li>Laboratory should be stocked with all necessary consumable materials (chemicals, reagents, kits, gloves, etc).</li> <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, glassware etc.</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student's feedback on effectiveness of teaching.	<ul style="list-style-type: none"> <li>Students</li> </ul>	<ul style="list-style-type: none"> <li><b>Indirect:</b> Questionnaire Survey at the end of each semester</li> </ul>
Quality of learning resources (laboratory and library) related to each course.	<ul style="list-style-type: none"> <li>Students</li> <li>Staff members</li> </ul>	<ul style="list-style-type: none"> <li><b>Indirect:</b> Questionnaire Survey at the end of each semester related to learning resources.</li> </ul>
Evaluation of teaching	<ul style="list-style-type: none"> <li>Peer evaluators</li> </ul>	<ul style="list-style-type: none"> <li><b>Indirect:</b> Peer evaluation</li> </ul>
Evaluation of exam quality and assessment.	<ul style="list-style-type: none"> <li>Exam committee</li> <li>Students</li> </ul>	<ul style="list-style-type: none"> <li><b>Direct:</b> Exam paper/ exam blueprint review</li> <li><b>Indirect:</b> Questionnaire Survey at the end of each semester.</li> </ul>
Achievement of course learning outcomes	<ul style="list-style-type: none"> <li>Course Coordinators</li> <li>Development and accreditation committee</li> </ul>	<ul style="list-style-type: none"> <li><b>Direct:</b> Student's Performance assessed through item analysis and rubrics.</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>	Department Council
<b>Reference No.</b>	Meeting Number 11
<b>Date</b>	19/05/2022

