



# Course Specifications

<b>Course Title:</b>	<b>Clinical Biochemistry II</b>
<b>Course Code:</b>	<b>373320-3</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>



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## A. Course Identification

<b>1. Credit hours: 3 hours</b>			
<b>2. Course type</b>			
a.	University <input type="text"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b>		<b>Level 6/Third Year</b>	
<b>4. Pre-requisites for this course (if any):</b> <b>Clinical Biochemistry I (373310-3)</b>			
<b>5. Co-requisites for this course (if any):</b> <b>None</b>			

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

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hours /week= 60 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	30
2	Laboratory/Studio	30
3	Tutorial	None
4	Others (specify)	None
	<b>Total</b>	<b>60</b>
<b>Other Learning Hours*</b>		
1	Study	51
2	Assignments	20
3	Library	None
4	Projects/Research Essays/Theses	None
5	Others(specify)	None
	<b>Total</b>	<b>71</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 purpose of this course is to make students understand the basic mechanisms involved in normal and abnormal biochemical processes, identify the role of enzymes and other biochemical substances involved in derangement of these processes. The students are also expected to know the clinical biochemical investigations involved in diagnosis of gastrointestinal, bone metabolism as well as inherited metabolic diseases and identify techniques involved in these measurements.

### 2. Course Main Objective

At the end of studying this course, the students should be able to recall the enzymes and analytes used in assessment of gastrointestinal, bone, heme metabolism and inherited metabolic disorders, diabetes mellitus and cancer, outline investigations and interpret laboratory data used in diagnosis of these disorders and perform procedures and techniques used in clinical chemistry laboratory.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge:</b>	
1.1	Describe the biochemical basis of diabetes mellitus, obesity, bone and nervous system disorders, oxidative stress, cancer.	K1
1.2	Recognize techniques and procedures for the collection of different types of specimen and know the principles of storage, handling and analysis.	K2
1.3	Identify the different methods for laboratory diagnosis of biochemical investigations in relation to diabetes mellitus, obesity, bone, nervous system disorders, oxidative stress and cancer.	K2
2	<b>Skills:</b>	
2.1	Interpret laboratory data and its correlation with disease process.	S2
3	<b>Competence:</b>	
3.1	Perform tests using instruments and biochemical analyzer in clinical chemistry laboratory in a proficient manner.	C3

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

No	List of Topics	Contact Hours
1	Gastrointestinal disorders and malabsorption	2
2	Obesity	2
3	Diabetes Mellitus and hypoglycaemia	4
4	Biochemical investigations in bone disorders	2

5	Heme metabolism disorders	2
6	Biochemical investigations in nervous system disorders	2
7	Inherited metabolic disorders I (protein metabolism)	2
8	Inherited metabolic disorders II (Carbohydrate metabolism)	2
9	Inherited metabolic disorders III (Lipid metabolism)	2
10	Nutritional disorders	2
11	Oxidative stress and free radical injuries	4
12	Cancer biochemistry	2
13	Gastrointestinal disorders and malabsorption	2
<b>Total</b>		<b>30</b>

### (b) Course Content (Practical)

No	List of Topics	Contact Hours
1	Estimation of serum pancreatic amylase and lipase	2
2	Estimation of serum intestinal lactase	2
3	Glucose tolerance test	2
4	Determination of glycated hemoglobin	2
5	Spectrophotometric estimation of glucose in urine	2
6	Spectrophotometric estimation of ketone bodies in urine	2
7	Estimation of serum calcium and phosphorus	2
8	Determination of parathyroid hormone in blood	2
9	Determination of 25-hydroxyvitamin-D in blood	2
10	Porphyrin tests	2
11	Cerebrospinal fluid examination: Test for proteins - Test for glucose	2
12	Determination of G6PD levels in blood	4
13	Determination of pyruvate kinase levels in blood	2
<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</b>		
1.1	Describe the biochemical basis of diabetes mellitus, obesity, bone and nervous system disorders, oxidative stress, cancer.	- Lectures	- Exam
1.2	Recognize techniques and procedures for the collection of different types of	- Lectures - Practical sessions	- Exams - Lab Reports

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	specimen and know the principles of storage, handling and analysis.		
1.3	Identify the different methods for laboratory diagnosis of biochemical investigations in relation to diabetes mellitus, obesity, bone, nervous system disorders, oxidative stress and cancer.	- Lectures - Practical sessions	- Exams - Lab Reports
<b>2.0</b>	<b>Skills</b>		
2.1	Interpret laboratory data and its correlation with disease process.	- Lectures - Practical sessions - Problem based learning	- Exams - OSPE
<b>3.0</b>	<b>Competence</b>		
3.1	Perform tests using instruments and biochemical analyzer in clinical chemistry laboratory in a proficient manner.	- Lecture - Practical sessions	- Exams - Assessment of Scientific Activities

## 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	Activity	Throughout the semester	5%
3	Practical Report	Throughout the semester	10%
4	Final Practical Exam	14 <sup>th</sup> Week	20%
5	Final Exam	17 <sup>th</sup> /18 <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, 7th edition, Wolter Kluwer, Philadelphia.(primary reference)</li> <li>- Devlin, T.M. (2015). Textbook of Biochemistry with Clinical Correlations, 7th edition, John Wiley and Sons.</li> <li>- Burtis, C.A., and Ashwood E.R. (Eds):</li> <li>- Tietz fundamentals of clinical chemistry, 6th edition, W.B Saunders Company, 2007</li> <li>- Clinical Chemistry, techniques, principles &amp; correlations, sixth edition by Michael L. Bishop, Wolter &amp; Kluwer, 2010</li> </ul>
<b>Essential References Materials</b>	None
<b>Electronic Materials</b>	None
<b>Other Learning Materials</b>	None

### 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)	Spectrophotometry ELISA Electrophoresis

## 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.

Evaluation Areas/Issues	Evaluators	Evaluation Methods
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 Meeting
Reference No.	Meeting No.10
Date	10-9-1440

