



# Course Specifications

<b>Course Title:</b>	<b>Medical Laboratory Instrumentation</b>
<b>Course Code:</b>	<b>373229-2</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:</b> 2 hours
<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 4/Second Year
<b>4. Pre-requisites for this course (if any):</b> None
<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	2 hours /week= 30 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	None
3	Tutorial	None
4	Others (specify)	None
	<b>Total</b>	<b>30</b>
<b>Other Learning Hours*</b>		
1	Study	39 hours
2	Assignments	4 hours
3	Library	None
4	Projects/Research Essays/Theses	None
5	Others(specify) (e-learning from videos)	7 hours
	<b>Total</b>	<b>50 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

This course is designed to introduce students to the basic laboratory instrumentation with the analytical methods common to both clinical and research laboratories. The course will help them explore miscellaneous instruments and techniques through their applications and uses.

## 2. Course Main Objective

To provide knowledge of basic laboratory instrumentations, their safety and principles.

## 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge:</b>	
1.1	Describe the function and principles of the major clinical laboratory instruments and their components	K2
1.2	Recognize the possible hazards and safety precautions for the different clinical laboratory instruments.	K2
2	<b>Skills :</b>	
2.1	Explain principles of laboratory safety and quality assurance/performance explicitly.	S3
2.2	Recognize the necessity for careful observation and accurate measurement and calibration.	S3
2.3	Practice data analysis as applied to clinical laboratory setting.	S4
3	<b>Competence:</b>	
None		

## C. Course Content

No	List of Topics	Contact Hours
1	<b>Safety and quality control</b> <ul style="list-style-type: none"><li>- Lab and equipment safety</li><li>- Quality control and Quality assurance</li></ul>	4
2	<b>Bioimaging</b> <ul style="list-style-type: none"><li>- Light microscope</li><li>- Electron microscope</li><li>- Fluorescent microscope</li></ul>	4
3	<b>Chemical Analysis</b> <ul style="list-style-type: none"><li>- Spectrophotometer</li><li>- Atomic Absorption Spectroscopy</li><li>- Atomic Emission Spectroscopy</li><li>- Chromatography</li><li>- HPLC</li><li>- Automated Chemical analyzer</li></ul>	12

4	<b>Hematological analyzers</b> - CBC - Flow cytometry	4
5	<b>Molecular</b> - PCR - Electrophoresis and gel documentation system	4
6	<b>Immunology</b> - ELISA	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	<b>Knowledge:</b>		
1.1	Describe the function and principles of the major clinical laboratory instruments and their components	-Lecture	- Exams
1.2	Recognize the possible hazards and safety precautions for the different clinical laboratory instruments.	-Lectures	- Exams - Assignments
2	<b>Skills :</b>		
2.1	Explain principles of laboratory safety and quality assurance/performance explicitly.	- Lectures	- Exams
2.2	Recognize the necessity for careful observation and accurate measurement and calibration.	- Lecture	- Exams
2.3	Practice data analysis as applied to clinical laboratory setting.	- Lecture - Students' learning activities	- 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	30%
2	Activity	Throughout the semester	10%
3	Final Exam	17 <sup>th</sup> /18 <sup>th</sup> Week	60%
4	Total		100%

\*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>	Linne & Ringsrud's Clinical Laboratory Science: The Basics and Routine Techniques. (2012) Turgeon ML. 6th Ed. Mosby: Maryland, USA.  Bioinstrumentation. (2003) Webster JG. Wiley: Hobecken, New Jersey, USA. RamnikSood. 1999. Medical Laboratory Technology: Methods and Interpretations. 5th Edition
<b>Essential References Materials</b>	None
<b>Electronic Materials</b>	Virtual labs at <a href="http://www.labster.com">www.labster.com</a> . Principles of each instrument at <a href="http://www.youtube.com">www.youtube.com</a> .
<b>Other Learning Materials</b>	None

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms

Item	Resources
<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 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

