



Course Specifications

Course Title:	Toxicology
Course Code:	373324-2
Program:	Bachelor's in Clinical Laboratory Sciences (Level-7)
Department:	Clinical Laboratory Sciences
College:	Applied Medical Sciences
Institution:	Taif University



Table of Contents

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

A. Course Identification

1. Credit hours: 2 hours
2. Course type 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"/>
3. Level/year at which this course is offered: Level 6/Third Year
4. Pre-requisites for this course (if any): None
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours /week= 45 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
Contact Hours		
1	Lecture	15
2	Laboratory/Studio	30
3	Tutorial	None
4	Others (specify)	None
	Total	45
Other Learning Hours*		
1	Study	42
2	Assignments	4
3	Library	None
4	Projects/Research Essays/Theses	None
5	Others(specify)	None
	Total	46

*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

Toxicology and toxicological mechanism cover the study of poisonous chemicals, drugs, carcinogens, and other exogenous compounds. The adverse effects of these chemicals in each body system, as well as their metabolism and detoxification from the body will be covered. This course will also cover dose/effect relationships and route of exposure (chronic or acute) in addition to public health implications (including age, sex, environmental, clinical, industrial, and legal issues of exposure) and types of toxicology (Analytic/forensic, clinical, environmental and occupational toxicology).

2. Course Main Objective

The student will know how to interpret and explain concepts of toxicology covered in class and how to solve complex toxicological emergency situations using critical thinking skills. The student will also be able to design and formulate experiments to test or challenge hypotheses presented in the toxicology laboratory.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	State the effect of the chronic and acute exposures to toxic chemicals (drugs, carcinogens, pesticides, metals, radioactive materials, and other), with special emphasis on their dose response, metabolism and detoxification.	K1
1.2.	Identify principles of applied clinical toxicological laboratory including instrumentation, testing (Colorimetric, fluorescence and luminescence analysis) for targeted organs and targeted indicators (enzymatic reactions, genetic factors, proteins, trace elements, toxic metals and xenobiotics).	K2
2	Skills :	
2.1	Explain sample preparation for toxicological analysis, analytical skills in methodology and post-analytical interpretive conclusive remarks.	S1
2.1	Interpret laboratory data and correlate it with clinical manifestation of toxic chemicals type.	S2
3	Competence:	
3.1	Use problem solving and leadership skills in toxicological laboratory practice	C4

C (a) Course Content (Theory)

No	List of Topics	Contact Hours
1	Principles of Toxicology	3
2	Mechanisms of Toxicity	1
3	Toxicokinetics: Absorption, distribution, biotransformation, excretion, and disposition	2
4	Toxic agents classification	2
5	Non-organ-directed toxicity	1
6	Target organ toxicity	3
7	Food Toxicology	1
8	Analytic/Forensic and Clinical Toxicology	1
9	Environmental and Occupational Toxicology	1
Total		15

(b) Course Content (Practical)

No	List of Topics	Contact Hours
1	Sample Preparation for Toxicological Analysis	2
2	Color Tests and Spectrophotometric Analysis	4
3	Fluorescence and Luminescence Techniques	2
4	Enzymatic Reactions and Protein Analysis	2
5	Basic Laboratory Operations	4
6	Cytotoxicity and Lethality	2
7	Genetic Analysis	2
8	Trace Elements and Toxic Metals	2
9	Immunoassays and Enzyme-Based Assays	2
10	Toxicology Testing at the Point of Emergency	4
11	Absorption, Distribution, Metabolism and Excretion of Xenobiotics	2
12	Clinical Interpretation of Analytical Results	2
Total		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	Knowledge		
1.1.	State the effect of the chronic and acute exposures to toxic chemicals (drugs, carcinogens, pesticides, metals, radioactive materials, and other), with special emphasis on their dose response, metabolism and detoxification.	Lectures	- Exams
1.2.	Identify principles of applied clinical toxicological laboratory including instrumentation, testing (Colorimetric, fluorescence and luminescence analysis) for targeted organs and targeted indicators (enzymatic	Lectures Practical sessions	- Exams - Lab reports

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	reactions, genetic factors, proteins, trace elements, toxic metals and xenobiotics).		
2.0	Skills		
2.1.	Explain sample preparation for toxicological analysis, analytical skills in methodology and post-analytical interpretive conclusive remarks.	Lectures Practical sessions	- Exams
2.2.	Interpret laboratory data and correlate it with clinical manifestation of toxic chemicals type.	Lectures Practical sessions	- Exams
3.0	Competence		
3.1.	Use problem solving and leadership skills in toxicological laboratory practice	Problem based learning	- Exams - Rubric

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	8 th Week	15%
2	Activity	Throughout the semester	10%
3	Practical Report	Throughout the semester	5%
4	Final Practical Exam	16 th Week	20%
5	Final Exam	17 th /18 th Week	50%
6	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 member's 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

Required Textbooks	CASARETT AND DOULL'S TOXICOLOGY: THE BASIC SCIENCE OF POISONS. Seventh Edition. EDITOR: Curtis D. Klaassen, 2008, McGraw-Hill, MEDICAL PUBLISHING DIVISION
Essential References Materials	None
Electronic Materials	https://jawaidzai.files.wordpress.com/2013/09/casarett_and_doull_s_toxicology-the_basic_science_of_poisons_7th_edition_2008.pdf
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms and Laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Blackboard and A/V
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Microtiter reader for absorbance, centrifuge, incubator, fluorescence microscope, electrophoresis system, pipettes.

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 equipment related to each course.	Students and faculty	Indirect: Questionnaire Survey at the end of each semester.
Evaluation of teaching	Students	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

