



Department of Biology
College of Science
University of Salahaddin
Subject: Toxicology
Course Book: Fourth Class
Academic year: 2023-2024

Course book

Course Title		Toxicology
Code	Theory Hr./week	Practical Hr./week
SBIO	2	2

Course type	Compulsory
Department/College	Biology(Biomedical)/Science
Course language	English

<p>Course lecturer(s)</p>	<p>Dr. Abdulilah Saleh Ismaeil M.Sc. Renas Najat Saleem</p>
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<p>Teacher's academic Profile</p>	<p>Abdulilah Saleh Ismaeil I graduated in 1998 from Salahaddin University - college of science, biology department, ranked third among biology department. I got master science (Food microbiology) in 2005 at college of science-salahaddin university. I got PhD in Food Microbiology at college of science-salahaddin university in 2020.</p> <p>Renas Najat Saleem I graduated from Salahaddin University-College of science in 2005. In 2012, I finished my Higher Diploma degree at Salahaddin University. In 2016, I finished my M.Sc. degree in Salahaddin University. Now I am PhD. Student in Hematology.</p>
<p>Course Objectives</p>	<p>Upon successfully completing this course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the chemical properties and the biological processes which modulate the toxicokinetics of chemical agents of public health importance. • Explain the significance of biotransformation

	<p>reactions as a determinant of the toxicokinetic and toxicodynamics activities of chemicals.</p> <ul style="list-style-type: none"> • Describe molecular, cellular and pathophysiological responses resulting from exposure to chemical agents relevant to human health. • Identify underlying susceptibility factors which contribute to the ability of chemicals to elicit bio-effects which contribute to human disease. • Explain the science underlying testing for the ability of chemicals to elicit adverse human health effects. • Put into perspective the role of toxicology in the risk assessment process. • Discuss in depth the toxicology of selected organs and agents.
<p>Intended Learning Outcomes</p>	<p>In this course, you will learn the basic principles that govern how chemicals interact with cells and organisms to cause adverse effects and what the critical determinants are that determine whether or not an adverse effect might occur. This will provide you with new tools to help interpret the barrage of information presented to you in the lay press and should be helpful in your professional activities.</p>
<p>Forms of teaching</p>	<p>Different forms of teaching will be used like writing the head titles and topics, as well as power point presentation to give illustration about the principles toxicological terms and the principle of each procedure or tests used in the laboratory. Illustration methods are used include whiteboard, marker, data show and paper sheet if needed, showing videos, preparing samples, blood</p>

	<p>collection.</p> <p>Furthermore, students following up the results of the tests, writing notes, writing reports, doing weekly quizzes. Moreover, students may do educational field trips to food or water manufacturers and factories, besides students will be asked to prepare and answer the selective question marks assigned during the practical work or about the cause of the results. There will be discussions and give enough background to translate, solve, analyse, and evaluate problems sets, and different issues discussed throughout the course.</p> <p>To get the best knowledge from this course, it is suggested that to encourage the students to participate in classroom discussions, laboratory activities and asking the teachers, preparing the assignments given in the course.</p>
<p>Examinations and Grading</p>	<p>-Theoretical exam = 65% practical exam = 35%</p> <p>-Theoretical exam = 15% for the semester exam and 50% for the final</p> <p>Practical exam 35%. for the semester exam</p> <p style="padding-left: 40px;">Examinations: 20%</p> <p style="padding-left: 40px;">Assignments: 15%</p>
<p>Course Reading List and References:</p>	<p>"Fundamentals of Toxicology". (2005). Pandey, K; Shukla, J.P. and Trivedi, S.P. New Central Book Agency (P) Ltd. India.</p> <p>"Principals of Biochemical Toxicology", 2009, by John A. Timbrell, 4th edition, Informa healthcare.</p> <p>Scientific articles about toxicology.</p>

Weekly Subjects

First week

An Introduction of toxicology, Epidemiology, Toxicologic terms and definitions

Second week

Basic classification of toxicology, Toxicokinetics and Toxicodynamics

Third week

Dose response, General approach to poisoned patients.

Fourth week

Basic toxicological testing methods

Fifth week

Bacterial toxins, Bacterial Toxigenesis, Types of Bacterial toxins.

Sixth week

Mycotoxins, its definition and General features of mycotoxin formation, Mycotoxicosis

Seventh week - First exam.

Eighth week

Foodborne intoxication, Clinical signs and symptoms, Biotoxinations.

Ninth week

Biological effects of radiation, types of radiation, Radiotherapy. Ministry of Higher Education and Scientific research

Tenth week

Metals as Toxicants, Common Toxic Mechanisms and Sites of Action, lead, mercury and cadmium.

Eleventh week

Solvents as toxicants, Classes of solvents, Solvent abuse, Environmental contamination, Toxicokinetics,

Twelfth week

Properties and toxicities of animal venoms, Properties of animal toxins, Scorpions, Bees, Snake.

Thirteenth week

Toxic effects of pesticides, Economics and public health, Use of Pesticides, Human Poisoning, Insecticides, Herbicides, Fungicides, Rodenticides.

Fourteenth week - Second exam.

PRACTICAL WEEKLY SUBJECTS

Weeks	Subjects
1	Course book Terminology and Introduction to toxicology
2	Toxicity of hydrocarbons on microorganisms
3	Determination of Blood Alcohol concentration in Human.
4	Effect of UV radiation on bacterial growth.
5	Detection of food preservatives.
6	Acetaminophen poisoning
7	1st Examination
8	Cyanid poisoning
9	Detection of toxics in food and biological samples by digestion method
10	Preparation of nanoparticles
11	Application of nanoparticles
12	Detection of Microbial toxins
13	2 nd Examination