

Introduction:

Toxicology is the scientific study of adverse effects that occur in living organisms due to chemicals. Toxicology provides critical information and knowledge that can be used by regulatory agencies, decision makers, and others to put programs and policies in place to limit our exposures to these substances, thereby preventing or reducing the likelihood that a disease or other negative health outcome would occur. This course summarizes the history, scope and various mechanisms of toxicity. Furthermore, it provides the in-depth study of absorption, distribution and excretion of toxicants.

Course Objectives:

The aim of this course is to:

- Explain the history and scope of toxicology.
- Make the students understand various mechanisms of toxicity.
- Provide detailed information regarding absorption, distribution and excretion of toxicants.

Course Learning Outcomes:

At the end of the course, students will be able to:

- Explain the history and scope of toxicology.
- Describe various mechanisms of toxicity.
- Elaborate the pathways for absorption, distribution and excretion of toxicants.

Course Contents:

1. **History and Scope of Toxicology:** Antiquity, Middle Ages, Age of Enlightenment, Modern Toxicology
2. **Introduction to Toxicology:** Different Areas of Toxicology, Toxicology and Society, General Characteristics of the Toxic Response, Classification of Toxic Agents, Spectrum of Undesired Effects, Characteristics of Exposure, Dose–Response Relationship, Variation in Toxic Responses, Descriptive Animal Toxicity Tests
3. **Mechanisms of Toxicity:** Delivery: From the Site of Exposure to the Target, Reaction of the Ultimate Toxicant with the Target Molecule, Cellular Dysfunction and Resultant Toxicities, Inappropriate Repair and Adaptation
4. **Absorption, Distribution and Excretion of Toxicants:** Absorption, Distribution and Excretion

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
Final term Exam:	40 marks

Books Recommended:

1. KLAASSEN, CURTIS D., (1996). *Casarett and Doull's Toxicology: The Basic Science of Poisons*; 5th Ed. (International), McGraw-Hill, Health Professions Division, New York.
2. Timbrel, J.A., 1995. *Introduction to Toxicology*, 2nd Ed. Taylor and Francis Ltd., London.

Books Recommended:

1. Hayes, A. Wallace, 1994. *Principles and Methods of Toxicology*, Third Ed., Raven Press, New York.

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Course Contents:

Determination of LD50 values of some pesticide against any insect pest. Determination of LD50 doses of any toxic compound in mammalian system. Effect of any toxicant on body weights in mice. Toxicity of some toxic compound on relative organ weights in mice. Effect of toxicant on food consumption in mice. Study of toxicity of any chemical on total leukocytic count. Effect of a toxicant on total erythrocytic count in blood of mice. Effects of any toxicant on haemoglobin level in mice. Study of inhibition of cholinesterase enzyme activity by organophosphate insecticides in mice. Study of liver function enzyme (Alanine amino transferase) activity following administration of toxic compound to experimental animals. Determination of blood glucose level following toxic exposure.

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