



Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH-430	Toxicology/ Τοξικολογία	6
Prerequisites	Department	Semester
IMPH-215	Health Sciences	Fall/Spring
Type of Course	Field	Language of Instruction
Compulsory	Pharmacy	Greek/English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr Eleftheria Galatou	4 th
Mode of Delivery	Work Placement	Corequisites
Face-to-Face	N/A	N/A

Course Objectives:

The main objectives of the course are to:

- Explain to students the adverse effects of exposure to drugs (toxic levels) or substances of abuse.
- Give to students the understanding of the principles of toxicodynamics, toxicokinetics, biotransformation, diagnosis and treatment.
- Introduce the toxic effects and mechanism(s) of action of the various drug classes, body system(s) affected, clinical manifestations of problems and the resulting adverse effects on human health and society. Relevant antidotes will also be covered.
- Explain to students the methods of treatment and patient education will also be addressed.
- Introduce the laws that control and govern the use of these drugs/substances and the agencies responsible for them

Learning Outcomes:

After completion of the course students are expected to be able to:

- Outline the mechanisms of toxicity of a number of compounds at a molecular, cellular and systems level in terms of application to clinical practice
- Characterize the clinical toxicology of drug overdose from drug abuse/misuse or accidental exposure and evaluate in terms of patient safety

- Describe the procedures used in the pharmaceutical industry and health community for the evaluation of the safety of new drugs and medicines including the use of radiopharmaceuticals
- Recognize specific antidotes for toxicity in several systems (heart, kidneys, liver, neural system)
- Demonstrate skills in accessing medical and scientific literature

Course Content:

I. Principles of Toxicology

- A. Classification of Toxic Agents
- B. Characteristics of Exposure
- C. Spectrum of Undesired Effects
- D. Interaction of Chemicals
- E. Tolerance
- F. Dose Response

II. Mechanisms of Toxicity

- A. Delivery
- B. Reaction

III. Risk Assessment

- A. Definitions
- B. Risk Perception
- C. Hazard Identification
- D. Characterization of Risk

IV. Disposition of Toxicants

- A. Absorption, Distribution and Excretion of Toxicants
- B. Biotransformations of Xenobiotics
- C. Toxicokinetics

V. Toxic Agents

- A. Toxic Effects of Pesticides
- B. Toxic Effects of Metals
- C. Toxic Effects of Solvents and Vapors
- D. Toxic Effects of Radiation and Radioactive Materials
- E. Toxic Effects of Animal Toxins
- F. Toxic Effects of Plants

VI. Environmental Toxicology

- A. Air-borne Toxicants
 - 1. Air-pollution in perspective
 - 2. Epidemiological Evidence of Health Effects from Air Pollution
- B. Aquatic and Terrestrial Ecotoxicology
 - 1. Principles of Ecotoxicology
 - 2. Environmental Chemistry and Chemodynamics
 - 3. The Use of Biomarkers
 - 4. Aquatic Toxicology
 - 5. Terrestrial Toxicology

VII. Other Applications of Toxicology

- A. Food Toxicology

B. Analytic/Forensic Toxicology C. Clinical Toxicology D. Occupational Toxicology E. Regulatory Toxicology <u>VIII. Non-organ - Directed Toxicity</u> A. Chemical Carcinogenesis B. Genetic Toxicology C. Developmental Toxicology <u>IX. Organ Toxicity</u>
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Learning Activities and Teaching Methods:

Lectures, class discussion, assignments, workshops
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Assessment Methods:

Final exam, Midterm exam, Coursework

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Illustrated hand book of toxicology/ Γενική τοξικολογία Ουσίες, δράσεις, περιβάλλον	Reichl F. X., Ritter	Thieme publishing group/ ΕΚΔΟΣΕΙΣ ΠΑΣΧΑΛΙΔΗΣ	2010/ 2004	9783131269218/ 9789603991908
Κλινική Τοξικολογία & Θεραπευτική Αντιμετώπιση Δηλητηριάσεων	Νέου Π.	ΕΚΔΟΣΕΙΣ ΠΑΣΧΑΛΙΔΗΣ	2007	960-399-513-4
Casarett & Doull's Essentials of Toxicology	J. B. Watkins III, C. Klaassen	McGraw-Hill Professional 2nd edition	2010	978-0071622400
Pharmaceutical Toxicology	G.J. Mulder, L. Dencker	Pharmaceutical Press	2006	978 0 85369 593 6

Toxicology and Risk Assessment: A Comprehensive Introduction	Helmut Greim, Robert Snyder	Wiley e book	2008	978-0470868935
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