

Course Unit	Pharmacotoxicology	Field of study	Pharmacy
Bachelor in	Pharmacy	School	School of Health
Academic Year	2022/2023	Year of study	3
Type	Semestral	Semester	1
Level	1-3	ECTS credits	5.0
Code	9549-644-3104-00-22		
Workload (hours)	135	Contact hours	T - TP 60 PL - TC - S - E - OT 7,5 O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Joana Cristina Mendes Martins Coelho

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Conceptualize Pharmacotoxicology emphasizing its relevance, fields of action and policy areas of actuation and Apply correct terminology in the field of Pharmacotoxicology.
2. Explain the adverse effects of pharmacotherapy and the aspects in monitoring drug therapy.
3. Differentiate the characteristics of the stages of exposure to xenobiotic agents and describe the nature of the process of absorption, distribution, biotransformation and elimination of toxic agents
4. Describe and differentiate the general mechanisms of action of toxic substances (drugs) and the determinants of toxicity in different places of action.
5. Know the importance of some drugs and toxic agents more common and know how to evaluate their toxic potential for the individual.
6. Differentiate products not submitted to prescription (MNSRM) of medicines submitted to prescription mean (MNSRM) and know their toxic effects.
7. Understand and evaluate the potential interactions between medications. Know and evaluate therapy with antidotes in relation to an intoxication.
8. Know the rules and general cares of prevention of poisoning such as procedures to be in their occurrence.

### Prerequisites

Not applicable

### Course contents

History of Pharmacotoxicology; Aspects and general principles of Pharmacotoxicology; Introduction to Pharmacotoxicology; Toxicity Medicines Non-prescription Medical; Toxicity of drugs Anti-Inflammatory and Autacoids; Toxicity of Drugs Affecting Specific Organs; Toxicity of Antimicrobial Drugs; Toxicity of Drugs Antimycobacterials and Antifungal; Toxicity not addressed to specific organs; Drug Interactions; No drug toxicity; Care to take a case of poisoning.

### Course contents (extended version)

1. History of Pharmacotoxicology
2. Aspects and general principles of pharmacotoxicology
  - Concepts and basic principles of pharmacotoxicology
  - Basic terminology of pharmacotoxicology
  - Fields of action of Toxicology
  - Practice Areas Toxicology
  - Characteristics of exposure
  - Classification of Toxic
  - Dose - response
  - Spectrum of desirable effects
  - Classification of poisonings
3. Introduction to Pharmacotoxicology
  - Pharmacokinetics versus Toxicokinetics
  - Pharmacodynamics versus Toxicodynamic
4. Toxicity Medicines Non-prescription Medical
  - Concept Medicines Non-prescription Medical (MNSRM)
  - Paracetamol Toxicity
  - Toxicity of Salicylates (Aspirin)
  - Toxicity of Caffeine
5. Toxicity of drugs Anti-Inflammatory and Autacoids
  - Toxicity of Drugs Anti-Inflammatory
  - Toxicity of Drugs Autacoides
6. Toxicity of Drugs Affecting Specific Organs
  - Drugs affecting the Central Nervous System
  - Drugs affecting the Cardiovascular System
  - Drugs affecting the Endocrine System
  - Drugs affecting the Respiratory System
  - Drugs affecting the Renal System
7. Toxicity of Antimicrobial Drugs
  - Principles of Antimicrobial Treatment
  - Toxicity of Cell Wall Inhibitors
  - Toxicity of the Protein Synthesis Inhibitors
  - Toxicity of Quinolones, Folic Acid Antagonists and Urinary Tract Antiseptics
8. Toxicity of Drugs Antimycobacterials and Antifungal
  - Toxicity of Drugs Antimycobacterials
  - Toxicity of Drugs Antifungal
9. Toxicity not addressed to specific organs – (Toxicity Effects of antineoplastic agents)
  - Antimetabolites
  - Antibiotics
  - Alkylating Drugs
  - Microtubule Inhibitors
  - Steroidal Hormones and their Antagonists
  - Monoclonal Antibodies
  - Other Chemotherapy Drugs
10. Drug Interactions
  - General considerations of Drug interactions
  - Classification of interactions
  - The role of the pharmacy professional in identifying drug interactions
  - Classes of potentially interactive drugs
11. Toxicology (No Drug Toxicity)
  - Toxicity of Pesticides
  - Toxicity of Heavy Metals
  - Toxicity Effects of Solvents and Vapors

**Course contents (extended version)**

- Antidotes
- 12. Care to take a case of poisoning

**Recommended reading**

1. Hardman, J. G. , & Limbird, L. E. (2003). Goodman & Gilman - As Bases Farmacológicas da Terapêutica (10ª ed. ). Rio de Janeiro, Brasil: McGraw-Hill.
2. Harvey, R. A. , Champe, P. C. , & Micek, M. J. (2002). Farmacologia Ilustrada (2ª ed. ). Porto Alegre, Brasil: Artmed.
3. Klaassen, C. D. , & Watkins III, J. B. (2001). Toxicologia - A Ciência Básica dos Tóxicos de Casarett & Doull's (5ª ed. ). Lisboa, Portugal: McGraw- Hill.
4. Page, C. , Curtis, M. , Sutter, M. , Walker, M. , & Hoffman, B. (2004). Farmacologia Integrada (2ª ed. ). São Paulo, Brasil: Manole.
5. Rang, H. P. , Dale, M. M. , Ritter, M. M. , & Flower, R. J. (2011). Rang & Dale - Farmacologia (7ª ed. ). Rio de Janeiro, Brasil: Elsevier.

**Teaching and learning methods**

Theoretical- Practical Learning methods: Expositive method

**Assessment methods**

1. Theoretical and Practical: - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 35% (1st - Intermediate Written Test (minimum grade of 8. 5 values according to pedagogical regulation).)
  - Intermediate Written Test - 35% (2nd - Written Intermediate Test (minimum grade of 8. 5 values according to pedagogical regulation).)
  - Development Topics - 30% (Research work framed in the programmatic content of the subject.)
2. Theoretical and Practical: - (Regular) (Supplementary, Special)
  - Final Written Exam - 100% (Final Written Exam)
3. Theoretical and Practical: - (Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100% (Final Written Exam)
4. Theoretical and Practical: - (Erasmus) - (Regular, Student Worker) (Final, Supplementary, Special)
  - Development Topics - 100% (Research work framed in the programmatic content of the subject.)

**Language of instruction**

1. Portuguese
2. Portuguese, with additional English support for foreign students.

**Electronic validation**

Joana Cristina Mendes Martins Coelho	Olivia Rodrigues Pereira	Juliana Almeida de Souza	Adília Maria Pires da Silva Fernandes
01-11-2022	15-11-2022	03-01-2023	07-01-2023