UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Farmacology

2425-2-I0302D034

Aims

The integrated course of Pharmacology and Anesthesiology aims to provide students with a basic understanding of drug action and anesthesiology techniques within the context of applications in the biomedical laboratory.

Contents

During the integrated course, students will explore the fundamental principles of general pharmacology, focusing on the mechanism of action of major drugs used in clinical and laboratory practice. Emphasis will be placed on pharmacological interactions and the mechanisms through which drugs produce their desired effects. Concurrently, students will be introduced to the basic principles of resuscitation techniques, providing them with essential knowledge to intervene in cardiorespiratory, respiratory, and neurological emergencies, including the application of local and systemic anesthetic drugs according to first aid protocols.

Detailed program

The **Pharmacology** module will begin with a historical overview of pharmacology, exploring its development over time and illustrating the drug development phases: distinguishing between preclinical and clinical phases, and understanding the importance of pharmacovigilance. Subsequently, fundamental concepts of pharmacokinetics will be explored, describing drug fate in the body through Absorption, Distribution, Metabolism, and Excretion (ADME) phases. Students will explore various drug administration routes, their bioavailability, first-pass effect, distribution in body tissues, and metabolism via biotransformation processes such as Phase I and Phase II, with a focus on cytochrome P450 enzymes. Drug excretion, including renal elimination mechanisms and the enterohepatic circulation phenomenon, will also be analyzed. The module will continue with the study of pharmacodynamics, focusing on the effects of drugs on the body and the mechanisms through which these effects are mediated.

Classification of receptors and drug-receptor interactions will be explored, along with dose-response curves to understand the relationship between administered drug dose and biological response. Therapeutic index and therapeutic window, indicating drug safety, will also be considered. Individual variability in drug response will be discussed, along with factors influencing it, and an overview of adverse drug reactions, including hypersensitivity, idiosyncrasy, and allergy, will be provided.

The **Anesthesiology** module will delve into the causes and management of emergencies such as shock, acute respiratory failure, and acute alterations in consciousness state. Students will gain practical skills in resuscitation techniques and basic principles of first aid. Mechanisms of action of local anesthetics will be studied, with an overview of more advanced techniques such as general anesthesia and sedoanalgesia.

Prerequisites

Teaching form

The integrated course adopts a diversified teaching approach that includes both lectures and interactive tutorial sessions.

In the Pharmacology module, students will participate in structured lectures that are both informative and interactive, utilizing the Wooclap platform for real-time quizzes and surveys to encourage active student engagement and deepen specific topics. For the Anesthesiology module, lectures will focus on active discussion of proposed clinical cases, supported by teaching materials provided by instructors.

All lectures will be delivered in Italian, with the inclusion of audiovisual materials occasionally in English.

During teaching sessions, discussions on gender differences in drug response and anesthesiology will be promoted, contributing to raising awareness among students about these important considerations in biomedical laboratory technique practice.

Textbook and teaching resource

For the integrated course, the following main textbooks are recommended:

• "General and Special Pharmacology for Three-year Health Degrees" by Cella, Di Giulio, Gorio, Scaglione (Ed. Piccin).
• "General Pharmacology" by Collino, Cicala, Ialenti (Ed. UTET).
• "Elements of Anesthesiology and Intensive Care" by Ranieri, Mascia, Terragni, Urbino (C. G. Medico Scientifiche Editions).

In addition to the recommended textbooks, instructors will provide supplementary teaching materials including slides used during lectures and any other relevant material to deepen the topics covered in the course.

Semester

second semester.

Assessment method

Assessment of the integrated course in Pharmacology and Anesthesiology is conducted through a single written exam.
This exam includes a series of multiple-choice questions distributed proportionally to the educational credits allocated to the two modules: 22 questions pertain to Pharmacology and 11 questions to Anesthesiology. For Pharmacology, there are open-ended questions that invite students to provide a brief elaboration on the topics covered during the lectures.

Evaluation of students will consider the correctness, relevance, and completeness of their responses, ensuring a fair and accurate assessment of the competencies acquired during the integrated course.

Office hours

Teachers will receive students by appointment, either in person or via online methods.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY