UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Farmacologia

2425-2-I0301D008

Aims

The integrated Pharmacology course aims to provide students with a fundamental understanding of drug action, anesthesia techniques, and substances used for caries prevention.

Contents

Throughout the integrated course, students will explore the fundamental principles of general pharmacology, focusing on the mechanism of action of key drugs used in dental hygiene. Emphasis will be placed on pharmacological interactions and the mechanisms through which drugs achieve their desired effects.
Additionally, students will be introduced to the basic principles of resuscitation techniques, gaining essential knowledge to intervene in cardiovascular, respiratory, and neurological emergencies, including the application of local and systemic anesthetic drugs according to first aid protocols.
Finally, students will acquire a methodological and operational approach to enhance oral health through chemical and mechanical treatments.

Detailed program

The **Pharmacology** module will begin with a historical overview of pharmacology, exploring its development over time and detailing 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 phases I and 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 drug effects on the body and the mechanisms through which these effects are mediated. Classification of receptors and drug-receptor interactions will be explored, with an analysis of dose-response curves to understand the relationship between administered drug dose and biological response. Therapeutic index and therapeutic window will also be considered to indicate drug safety. 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.

In the **Medical Emergencies and Urgencies** module, students will explore the causes and management of shock states. Techniques for managing acute respiratory failure and acute alterations in consciousness will also be covered. Additionally, resuscitation techniques and fundamental principles of first aid will be illustrated, including alerting the emergency response system, implementing first aid interventions, and acquiring practical intervention skills.
The **Anesthesiology** module will cover the mechanisms of action of local anesthetics, providing insights into general anesthesia and sedoanalgesia. Students will learn how these drugs act and their use in various clinical situations.

In the **Applicazione di sostanze atte a ridurre carie e recettività** module, students will examine gingival issues and innovative solutions for domiciliary oral hygiene. Concepts of gingivitis and periodontitis will be introduced, and how these conditions can be managed through control of pathogenic bacteria, host susceptibility, and maintenance of biological balance will be discussed. Innovative solutions for controlling pathogenic bacteria will be discussed, including mechanical tools such as toothbrushes, dental floss, and interdental instruments; chemical tools such as toothpaste and mouthwash with a particular focus on chlorhexidine; and biological tools such as oral probiotics.

Prerequisites

Knowledge of the introductory courses indicated in the regulation of the degree course are required.

Teaching form

The integrated course adopts a diversified teaching approach that includes both lecture-based teaching (frontal lessons) and interactive tutorial sessions.

During some interactive sessions, the Wooclap platform will be used. This tool offers various functionalities such as surveys, quizzes, and real-time discussions to make lectures more engaging and participative for students, fostering active interaction during teaching sessions and providing immediate feedback on learning.

All lessons are conducted in person.

In addition, audiovisual materials will be used, providing valuable support to facilitate understanding and memorization of the concepts covered. The integration of these tools aims to make the learning process more dynamic and accessible for students.

All lessons will be delivered in Italian, with occasional inclusion of audiovisual material in English.

During the teaching sessions, gender differences in drug response, anesthesiology, and the dental hygienist profession will be highlighted, contributing to raising awareness among students about these important considerations.

Textbook and teaching resource

For a comprehensive and detailed exploration of the topics covered in the course, we recommend studying the following texts:

For the **Pharmacology** module:

- "General and Special Pharmacology for Three-Year Health Degrees" by Cella, Di Giulio, Gorio, Scaglione, ED Piccin. This text provides a comprehensive overview of the fundamental principles of pharmacology, both general and specialized, tailored to the needs of three-year health degree courses.
- "General Pharmacology" by Collino, Cicala, Ialenti (Ed. UTET). A reference text covering extensively the fundamental concepts of general pharmacology, offering a solid theoretical and practical foundation for students in the course.

For the **Anesthesiology** module:

- "Elements of Anesthesiology and Intensive Therapy" by Ranieri, Mascia, Terragni, Urbino, C.G. Medico Scientifiche. A fundamental work to understand key concepts and clinical practices in anesthesiology and intensive therapy, essential for addressing medical emergencies and urgencies.

For the **Applicazione di sostanze atte a ridurre carie e recettività** module:

- "Clinical Practice of Dental Hygiene" by Esther Wilkins, PICCIN. An essential manual for students seeking practical and theoretical skills in oral hygiene and the prevention of gum diseases.
  These texts are recommended to deepen your understanding and mastery of the course content across its various modules.

Semester

The course will be delivered in the second year of the study program, during the second semester.

Assessment method

The assessment will consist of:

A written exam with closed-answer tests (multiple-choice questions) and open-ended questions to evaluate preparation on the exam syllabus.

22 multiple-choice questions and open-ended questions for the Pharmacology module.
11 multiple-choice questions for the Anesthesiology module.
For the module 'Application of Substances Aimed at Reducing Caries and Sensitivity,' the assessment will be carried out through a quiz consisting of 16 questions, with each question worth 2 points. Students will indicate whether each statement is true or false.

During the instructional sessions, gender differences in drug response, anesthesiology, and the dental hygienist profession will be highlighted, contributing to raising students' awareness of these important considerations.

Office hours

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

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | GENDER EQUALITY