UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Microbiology

2425-2-H4601D005-H4601D016M

Aims

The Microbiology module, within the General Human Sciences Course, aims to provide knowledge of:

- biology of microorganisms and their classification;
- fundamental notions of epidemiology;
- groups of microorganisms (bacteria, fungi, viruses) of particular dental interest and related infectious diseases
- methods of prevention of infectious diseases
- basics of the disinfection, sterilization and sanitization process
- antimicrobial drugs, with particular attention to antibiotics (activity and efficacy, phenomenon of antibiotic resistance in the clinical field)
- infectious risk in dentistry and risk management
- national and regional health organization

The student will be able to develop knowledge and understanding of the topics covered during the lessons of the Microbiology Module and will be able to apply the knowledge in professional activity, in the preventive and clinical fields

Contents

General Microbiology:
Structure, organization and replication of human pathogenic microorganisms. Mechanisms of transfer of genetic material between bacteria and principles of viral genetics.
Pathogenicity factors and host-microorganism relationship.
Mechanism of action of the main antimicrobial drugs. Mechanisms of acquisition of resistance to antibacterial and antiviral drugs. Strategies for the preparation of vaccines for the prevention of infectious diseases. Methods for the control and surveillance of infections.

Special Microbiology of the Oral Cavity:
Bacteriology, Virology, Mycology and Parasitology.
General criteria for classification of microorganisms. Main microbial agents responsible for infections in humans and related pathogenicity mechanisms. Main pathologies of the oral cavity and related pathogens.

Detailed program

Microbiology program

- General characteristics and classification of human pathogenic bacteria, viruses, fungi and protozoa
- Anatomy and physiology of the bacterial cell
- Host parasite interactions and mechanisms of microbial pathogenicity
- Curves of bacterial growth and microbial metabolism
- The microbial biofilm
- Microscopic examinations
- Isolation of bacteria in pure culture
- Culture media
- Methods for infection control
- Main techniques useful in microbiological diagnostics
- Microbial ecosystem of the oral cavity
- Dental plaque
- The cariogenic process
- Parodontitis
- Infections of the oral cavity
- Main classes of antimicrobial agents
- Mechanism of action of antibiotics
- Antimicrobial resistances
- Antimicrobial therapy and prophylaxis of infections of the oral cavity
- Antibiotic-prophylaxis and use of vaccines
- Main families and genera of pathogenic bacteria: Micrococcaceae, Streptococcus, Enterococcus, Neisseriaceae, Mycobacteriaceae, Actinomyces, Corynebacterium, Lactobacillus, Enterobacterales, Vibrionaceae, Bordetella, Legionellaceae, Moraxellaceae, Pseudomonadaceae, Acinetobacter, Peptococcus, Peptostreptococcus, Veillonellaceae, Clostridium, Bacteroides, F usobacterium , Porphyromonadaceae, Prevotellaceae, Pasteurellaceae, Helycobacter, Mycoplasma, Chlamydia, Spirochetes.
- The structure and replication of fungi
- Fungal opportunism
- Principles of fungal diagnostics
- Main genera of human pathogenic fungi
- Mechanisms of action and resistance of the main classes of antifungal agents in clinical use
- The structure and replication of viruses
- Viral pathogenetic mechanisms
- Principles of virological diagnostics
- Main families of human pathogenic viruses: Poxviridae, Herpesviridae, Hepadnaviridae, Adenoviridae, Papovaviridae, Parvoviridae, Togaviridae, Flaviviridae, Coronaviridae, Paramyxoviridae, Orthomyxoviridae, Rhabdoviridae, Arenaviridae, Picornaviridae, Retroviridae

Prerequisites

The student must have general knowledge of biology

Teaching form

- 21 2-hours lessons carried out in delivery mode in person

Textbook and teaching resource

- Laplaca Principi di microbiologia medica, Esculapio editore
- Antonelli, Clementi, Pozzi, Rossolini - Principi di Microbiologia Medica - IV edizione - CEA Casa Editrice Ambrosiana

Semester

I and II semester of the 2nd year

Assessment method

Written test and oral test: written test consisting of 20 multiple choice tests and 2 open questions to check the preparation on the exam program, on the ability of independent reflection, on the problem solving skills. The subsequent oral interview will focus mainly on the completed written tests. Time for the written test: 2 hours. Score assigned: up to a maximum of 10 points for the closed-answer test and 10 points for each open question. There are no ongoing tests.
The evaluation acquired in the Microbiology module, with a grade out of thirtieths, will be weighted according to the CFU awarded in each module for the final evaluation of the General Human Sciences Course.

Office hours

To be agreed by e-mail by appointment (rosario.musumeci@unimib.it)

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | PARTNERSHIPS FOR THE GOALS