

II year (2st semester)

Scientific Field	MICROBIOLOGY	TUTOR	ECTS
MED/07	Microbiology	Ceccherini Silberstein Francesca	1
MED/07	Microbiology	Pica Francesca	5
MED/07	Microbiology	Svicher Valentina	2
MED/07	Microbiology	Di Cave David	1
MED/07	Microbiology	Santoro Maria	1
		TOT	10

**PICA F.
COORDINATOR****TOPICS
GENERAL
BACTERIOLOGY**

Criteria for bacterial taxonomy and classification. The architecture of the bacterial cell : the bacterial chromosome, the cytoplasm, the cytoplasmic membrane. Gram staining. Gram positive and gram negative bacteria. Capsule. Flagella. Pili and fimbriae. Metabolism and bacterial growth: the production of bacterial spores. Bacterial genetics: chromosome and plasmids. The transfer of genetic material : transformation, transduction and bacterial conjugation. The pathogenic activity of bacteria and the stages of the infectious process. The bacterial adhesiveness, the ability to invade hosts, the production of toxins. Structure and mechanisms of action of exotoxins and endotoxins. The role of innate and cell-mediated immunity in bacterial infections. Immune sera and vaccines. General principles for the diagnosis of bacterial diseases. Antibacterial drugs and their mechanism of action.

	Mechanisms of bacterial resistance to antibacterial drugs.
TOPICS GENERAL MYCOLOGY	Fungi : structure, replication and dimorphism. Mechanisms of fungal pathogenicity.
TOPICS GENERAL VIROLOGY	Nature, origin and morphology of viruses, viral nucleic acids, proteins and lipids viral multiplication of animal viruses, virus-cell interaction. State of persistence and latency of the genome in the cell, host cell cultures, multiplication cycle, virus isolation animals, adaptation and virulence, inactivation of viruses, physical and chemical agents, cell surface antigens encoded by the virus, the immune response to viral infection. Interferons. Vaccines and antiviral chemotherapy.
TOPICS SPECIAL BACTERIOLOGY	Staphylococci . Streptococci. Pneumococci and Enterococci. Bacilli and Clostridia. Corynebacteria and Listeria. Enterobacteriaceae. Pseudomonas. Vibrio, Campylobacter and Helicobacter. Emophili, Bordetella and Brucella. Yersinia and Pasteurella. Neisseria. Anaerobic microorganisms. Legionella. Mycobacteria. Spirochetes. Mycoplasma. Rickettsiae. Chlamydiae. Gardnerella.
TOPICS SPECIAL MYCOLOGY	Fungal infections by opportunistic fungi. Superficial, cutaneous, subcutaneous and systemic mycoses.
TOPICS SPECIAL VIROLOGY	Adenovirus, Herpesvirus, Poxivirus, Papovavirus, Parvovirus, Picornavirus, Orthomyxovirus, Paramyxovirus, Rhabdovirus. Togavirus and other viruses transmitted by insects. Filovirus. Rubella virus. Reovirus and Rotavirus. Hepatitis A virus. Retroviruses. Human Retroviruses. RNA and DNA tumor viruses. Prions.
TOPICS GENERAL AND SPECIAL PARASITOLOGY	Systematics and Zoological Nomenclature, biological associations; general information on the life cycles of parasites, parasitic specificity , host – parasite interactions and pathogenic action of parasites, parasitic diseases of medical importance ; fight against parasitic diseases. Human parasites.

TEXTBOOKS

Patrick Murray r. et al. Medical Microbiology , Elsevier / Masson Editors Sixth Edition.

EXAM METHOD

Oral exams. (Possible intermediate evaluation through a written test).

EXAM COMMISSION

The Coordinator, full Professors of the disciplines, Professors of similar disciplines, Specialists of the subject, compose the exam Commission of the Integrated Course.

Pica Francesca, President	
Ceccherini Silberstein Francesca	
Svicher Valentina	
Di Cave David	
Santoro Maria	

CONTACTS

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PREREQUISITES: Previous knowledge and competence in the following subjects: Human anatomy1, Human Anatomy 2, Histology and Embryology, Immunology and Immunopathology.

The specific learning outcomes of the program are coherent with the general provisions of the Bologna Process and the specific provisions of EC Directive 2005/36/EC. They lie within the European Qualifications Framework (Dublin Descriptors) as follows:

1. Knowledge and Understanding

- Define the terms necessary to understand disease principles and epidemiology: normal and transient flora, opportunists, pathogen, infection, disease, virulence and its measures, etiology, nosocomial, epidemic, endemic, pandemic, portals of entry and exit, types of symbiosis, predisposing factors, morbidity and mortality.
- Present each topic emphasizing the characteristics concerning the structural composition, mechanism of action, epidemiology and clinical presentation.
- Describe the architecture, chemical composition, cultivation and classification of bacteria. Compare and contrast their growth pattern, survival strategies and immune escape mechanisms.
- Describe the architecture, chemical composition, cultivation and classification of viruses. Compare and contrast the lytic and lysogenic cycles and explain their importance; including latency. Describe various cytopathic effects of viruses, including tumors and cancers..
- Explain the major groups of fungi, protozoa, and helminths by their defining characteristics; as well as the various arthropod vectors, giving examples of diseases they transmit.

2. Applying Knowledge and Understanding

- Apply the theoretical knowledge to the clinical and laboratory setting, being able to recognize the general diagnostic aspects of infectious diseases.
- Understand and comply with laboratory safety rules and procedures, especially the constant use of aseptic technique and the proper handling of biohazards.
- Become familiar with procedures for performing and reporting laboratory experiments.
- Culture microbes on various media, observing their growth characteristics and factors affecting their growth.
- Compare and contrast light and electron microscopy; the uses and functions of scanning and transmission electron microscopy. Compare and contrast the procedures for observing living and dead microbes; differential and special stains and their purposes.
- Compare and contrast tools and techniques used in biotechnology, including recombinant DNA technologies, PCR, clonal selection, and therapeutic, agricultural and scientific applications.

3. Making Judgements

- Recognize the importance of an in-depth knowledge of the topics consistent with a proper medical education.
- Identify the fundamental role of a proper theoretical knowledge of the subject in the clinical practice.

4. **Communication Skills**

- Present the topics orally in an organized and consistent manner.
- Use of proper scientific language coherent with the topic of discussion.

5. **Learning Skills**

- Identify the possible use of the acknowledged skills in the future career.
- Assess the importance of the acquired knowledge in the overall medical education process.