



GENERAL MICROBIOLOGY TEACHING SCHEDULE

Degree Course:	Biological Sciences
Teaching Denomination:	General Microbiology
Credits Number:	9
Year/Semester:	II/II
Holder Professor:	Pagliarulo Caterina
PhD students / research fellows who carry out didactic activities to course support:	Sateriale Daniela
Reception hours:	13:00-15:00 wednesday and thursday
Address:	via Port'Arsa 11, Benevento

COURSE PRESENTATION:

General Microbiology course is dedicated to the illustration and analysis of the structural components and functions of bacterial cells. During the course, the main mechanisms of horizontal gene transfer will be addressed, which are the basis of bacterial cell genomic plasticity and diversity. The course also aims to provide suitable knowledge of antimicrobial drugs and the antibiotic resistance phenomenon. Adequate space will be given to the main groups of microorganisms of interest in the industrial and environmental sphere. Finally, the course aims is to provide the students, with the help of laboratory practicals, the necessary methodological skills in fundamental techniques for microbiology: stainings, growth, isolation and identification of microorganisms.

TRAINING AIMS

- Knowledge: Knowledge of morphological and structural characteristics, and physiological and metabolic characteristics of microorganisms. Understanding the topics of prokaryotic genetics, basis of the microbial genome diversity and plasticity. Knowledge of host-parasite interactions and the microorganisms-environment interactions. Knowledge of basic microbiological

techniques. Knowledge of fundamental topics of environmental microbiology and industrial microbiology.

- Skills: Acquiring the theoretical training needed for critical analysis of the fundamental topics of general, environmental and industrial microbiology. Acquiring the methodological skills needed to microbial growth, isolation and identification. Technical competences for antibiotics sensitivity testing methods.

REQUIRED PREREQUISITES

Basic chemical and biological disciplines

LESSONS FREQUENCY

The course frequency is strongly recommended in order to deal, with appropriate theoretical training, the practical experience expected for the didactic laboratory of microbiology. During the laboratory test, the student will face staining and microscopic techniques as well as microbiology culture techniques.

COURSE CONTENTS

Introduction to Microbiology. The prokaryotic cell: structure and functions. Microbiological techniques. Bacterial growth. Microbial metabolism. Genetics and bacterial genomics. Main strategies of gene expression regulation in prokaryotes. Quorum sensing. Diversity and microbial taxonomy. Antimicrobial agents. Antibiotic resistance. General Virology elements. Microorganisms of the industrial microbiology. Microorganisms of the environmental microbiology.

DIDACTIC METHODS

The course includes 7 CFUs dedicated to frontal lessons and 2 CFU dedicated to the activities of the microbiology didactic laboratory

REFERENCE TEXTS

Prescott et al. Microbiology McGraw-Hill Editor

Madigan et al. Brock. Biology of microorganisms. Pearson Editors

Perry et al. Microbiology Zanichelli Editor

PDF presentations on frontal lessons topics and some videos or reviews on particular topics will be provided through the download area of web portal DST Unisannio.

PROFIT EXAMINATION

The final exam is a written test followed by an oral test. As far as the oral test, fundamental evaluation elements will be: the relevance of responses to the questions asked, the contents quality, the ability to link with other topics covered by the microbiology program as well as other biological disciplines, the ability to portray examples graphically, the technical language property and the overall expressive capacity of the student.

EXAMS CALENDAR

[link](#)

EXAMS BOOKING

[link](#)

SYLLABUS

GENERAL MICROBIOLOGY SYLLABUS

Topics	hours	References	Lesson typology
Introduction to Microbiology. The prokaryotic cell: structure and functions.	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal
Microbial motility. Bacterial sporulation and germination	4	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal
Microbiological techniques: microscopy, disinfection,	8	<ul style="list-style-type: none"> • Prescott et al. 	Frontal + laboratory

sterilization, pasteurization		<p>Microbiology McGraw-Hill Editor</p> <ul style="list-style-type: none"> • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	
Microbiological techniques: staining, microbial growth, isolation and identification	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal + laboratory
Microbial nutrition and Metabolism	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors • 	Frontal+ laboratory
Genetics and bacterial genomics. Main strategies of gene expression regulation in prokaryotes. Quorum sensing.	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. 	Frontal + laboratory

		<p>Pearson Editors</p> <ul style="list-style-type: none"> • 	
<p>Antimicrobial agents. Antibiotic resistance. Antibiotics sensitivity testing methods.</p>	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal + laboratory
<p>Virology elements.</p>	2	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal
<p>Industrial Microbiology. Microorganisms of industrial microbiology. The "scale-up" of the fermentative process. Main products of industrial microbiology.</p>	6	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal + laboratory
<p>Industrial Microbiology. Cellulolytic Microorganisms.</p>	2	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock 	Frontal

		<p>Biology of microorganisms. Pearson Editors</p>	
<p>Environmental Microbiology. Microbial ecosystems. Microorganisms role in biogeochemical cycles. Rumen microbiology. Microorganisms and bioremediation.</p>	6	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal + laboratory
<p>Environmental Microbiology. Water Microbiology. Nitrogen-fixing microorganisms. <i>Agrobacterium tumefaciens</i></p>	4	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors 	Frontal