



APPLIED MICROBIOLOGY AND VIROLOGY TEACHING SCHEDULE

Degree Course:	Biology
Teaching Denomination:	Applied Microbiology and Virology
Credits Number:	6
Year/Semester:	II/I
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:

Applied Microbiology and Virology course is dedicated to analysis of human-pathogen interactions. Main virulence factors and virulence mechanisms of human pathogens will be illustrated in detail. Central topic of the course will be the study of the effects of foods and dietary supplements based on probiotics and prebiotics on human microbiota in particular and on human health in general. The main food-borne bacterial diseases, zoonotic viral infections and emerging viral diseases will be discussed also. Finally, the course aims is to provide the students, with the help of laboratory practicals, the necessary methodological skills for microbiological diagnostic and for antibiotics sensitivity testing methods.

TRAINING AIMS

- Knowledge: Knowledge of pathogenetic and molecular mechanisms of bacterial and viral infections. Understanding the possible consequences of eating habits on human well-being. Knowledge of the main pathogens transmitted with foods. Knowledge of microbiological indicators of food quality and safety.

- Skills: Acquiring theoretical training needed for critical analysis of fundamental topics of clinical microbiology and food microbiology. Acquiring of the methodological skills required to perform microbiological diagnostic tests.

REQUIRED PREREQUISITES

Basic chemical, biological and microbiological 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 conventional and innovative techniques in diagnostic microbiology.

COURSE CONTENTS

APPLIED MICROBIOLOGY

Pathogenicity and virulence in pre and post-genomic era. Virulence factors. Diagnostic methods used in microbiology for microorganisms isolation and identification. Microbiological assays for antimicrobial sensitivity profile. Impact and consequences of diets on human microbiota. Effects of Probiotics and Prebiotics on humans. Hygiene and food safety. Food-borne diseases. Zoonoses and zoonotic agents. Main pathogenic bacteria and toxins transmitted with food. *Salmonella*. *Campylobacter*. *Escherichia coli*. *Bacillus*. *Listeria*.

VIROLOGY

Animal viruses. Main zoonotic viral infections. Hepatitis viruses. Orthomyxovirus. Emerging viral diseases.

DIDACTIC METHODS

The course includes 5 CFUs dedicated to frontal lessons and 1 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

Antonelli et al. Medical Microbiology. CEA

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

APPLIED MICROBIOLOGY AND VIROLOGY SYLLABUS

Topics	hours	References	Lesson typology
Pathogenicity and virulence. Virulence factors. Endotoxins. Structure and action mechanism of main bacterial exotoxins	8	<ul style="list-style-type: none">• Prescott et al. Microbiology McGraw-Hill Editor• Madigan et al. Brock Biology of microorganisms. Pearson Editors• Antonelli et al. Medical Microbiology. CEA	Frontal

<p>Superantigens. Pathogenicity Islands. Microbial biofilms. Quorum sensing.</p>	<p>4</p>	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors • Antonelli et al. Medical Microbiology. CEA 	<p>Frontal</p>
<p>Diagnostic methods used in microbiology for microorganisms isolation and identification.</p>	<p>8</p>	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors • Antonelli et al. Medical Microbiology. CEA 	<p>Frontal + laboratory</p>
<p>Microbiological assays for antimicrobial sensitivity profile.</p>	<p>6</p>	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. 	<p>Frontal + laboratory</p>

		<ul style="list-style-type: none"> • Pearson Editors • Antonelli et al. Medical Microbiology. CEA 	
Human microbiota. Impact and consequences of diets on human microbiota. Probiotic bacteria. Functional foods and Probiotic supplements. Effects of Probiotics and Prebiotics on humans.	6	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors • Antonelli et al. Medical Microbiology. CEA 	Frontal
Hygiene and food safety. Microorganisms indicators of food quality and food safety. Food-borne diseases. Zoonoses and zoonotic agents: epidemiology and surveillance. Main pathogenic bacteria and toxins transmitted with food. <i>Salmonella</i> . <i>Campylobacter</i> . <i>Escherichia coli</i> . <i>Bacillus</i> . <i>Listeria</i> .	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill Editor • Madigan et al. Brock Biology of microorganisms. Pearson Editors • Antonelli et al. Medical Microbiology. CEA 	Frontal + laboratory
Animal viruses: structure, classification and replication. The main zoonotic viral	8	<ul style="list-style-type: none"> • Prescott et al. Microbiology McGraw-Hill 	Frontal

<p>infections: epidemiology and surveillance. Hepatitis viruses. Orthomyxovirus. Emerging viral diseases.</p>		<p>Editor</p> <ul style="list-style-type: none">• Madigan et al. Brock Biology of microorganisms. Pearson Editors• Antonelli et al. Medical Microbiology. CEA	
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