



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2022/2023		
BACHELOR'S DEGREE (BSC)	BIOMEDICAL LABORATORY TECHNIQUES		
INTEGRATED COURSE	CLINICAL MICROBIOLOGY - INTEGRATED COURSE		
CODE	09551		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	MED/46, MED/07		
HEAD PROFESSOR(S)	DE GRAZIA SIMONA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	DE GRAZIA SIMONA	Professore Ordinario	Univ. di PALERMO
	DISTEFANO	Professore a contratto	Univ. di PALERMO
	SALVATORE ANTONINO		
CREDITS	6		
PROPAEDEUTICAL SUBJECTS	19314 - MICROBIOLOGY AND CLINICAL PARASITOLOGY - INTEGRATED COURSE		
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>DE GRAZIA SIMONA Monday 12:00 13:30 Dpt Scienze per la Promozione della Salute e Materno infantile "G. D'Alessandro" Via del Vespro 133</p> <p>DISTEFANO SALVATORE ANTONINO Monday 13:30 14:30 Dipartimento di Scienze della Promozione della Salute, Materno-Infantile, Medicina Interna e Specialistica d'Eccellenza "G. D'Alessandro" , via del Vespro 133 (secondo piano)</p>		

PREREQUISITES	Students should have the basic knowledge of biology, biochemistry. You must have acquired a background of knowledge of physiology and general pathophysiology of human diseases
LEARNING OUTCOMES	<p>Knowledge and ability to understand: to know the main diseases caused by microorganisms and their pathogenetic processes.</p> <p>Ability to apply knowledge and understanding: Demonstrate the ability to apply the knowledge acquired. The capability to use the knowledge acquired with criticism oriented to the technical application, demonstrating to be able to choose the suitable methodology and laboratory procedures suitable for the diagnostic in microbiology.</p> <p>Autonomy of judgment: be able to understand the results obtained in relation to the the microorganism pathogenes and to the clinicians requires. Communication skills: be able transmit clearly the knowledge acquired.</p> <p>Learning skills: be able to study independently having acquired the necessary.</p> <p>Learning skills: be able to develop an appropriate study method necessary for an update of the knowledges required by the constant technological updating.</p>
ASSESSMENT METHODS	<p>Oral exam with evaluation expressed using a 30-point scale. The candidate will have to answer orally at least two questions inherent different parts of the program, in relation to the information acquired by the texts recommended and teaching tools supplied.</p> <p>Final assessment aims to evaluate whether the student has acquired knowledge and skills for a correct diagnostic approach, for the interpretation of the microbiological test and for the molecular characterization of microorganisms. The student will reach a threshold of sufficiency if his capability of knowledge, understanding and skills will be enough to solve simple concrete cases inherent to the focus of the course. He has also to acquire language properties to transfer his knowledge to the examiner. The student will fail the examination if he is not able to satisfy those requisites.</p> <p>The candidate will be evaluate according to his capability to argue and relate his knowledge and according to his practical skills. The vote will be proportional to his overall skill.</p> <p>ECTS grade; Italian Grade; Grade descriptors</p> <p>A – A+ Excellent; 30-30 cum laude Eccellente; Excellent knowledge of teaching contents; students should show high analytical and synthetic capabilities and should be able to apply their knowledge to solve highly complex problems.</p> <p>B Very good; 27-29 Ottimo; Very good knowledge of the teaching contents and excellent language control; students should show analytical and synthetic skills and be able to apply their knowledge to solve problems of medium and, in some cases, even higher complexity.</p> <p>C Good; 24- 26 Buono; Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity</p> <p>D Satisfactory; 21-23 Discreto; Average knowledge of the teaching contents, in some cases limited to the main topic; acceptable ability to use the specific discipline language and independently apply the acquired knowledge.</p> <p>E Sufficient; 18-20 Sufficiente; Minimum teaching content knowledge, often limited to the main topic; modest ability to use the subject specific language and independently apply the acquired knowledge.</p> <p>F Fail; Insufficiente; Lack of an acceptable knowledge of the main teaching content knowledge; very little or no ability to use the specific subject language and apply independently the acquired knowledge.</p>
TEACHING METHODS	Lectures

MODULE
LABORATORY MEDICINE TECHNICAL SCIENCES 2

Prof. SALVATORE ANTONINO DISTEFANO

SUGGESTED BIBLIOGRAPHY

- Elementi di Tecniche microbiologiche II ed. EMSI Nicola Simonetti, Giovanna Simonetti, Marcello Lembo 2001
- Laboratorio didattico di microbiologia Ann Vaughan - 2008 - Edito da CEA
- Luigi Spandrio, Manuale di laboratorio, Vol. II, PICCIN editore, 1987
- Hoskins JM, Diagnosi virologica, Casa Editrice Ambrosiana, 1975
- Koneman's – Atlante di Microbiologia Diagnostica 6^a – 7^a ed. (2009) – Antonio Delfino Editore
- Appunti delle lezioni, dispense e supporti informatici forniti dal docente

AMBIT	10341-Scienze e tecniche di laboratorio biomedico
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

Acquire basic knowledge and deepen some application aspects of microbiological analysis and diagnostic techniques, with particular attention to the most advanced and innovative methods and more widespread application in the working areas of relevance of the course.

Acquire basic knowledge and deepen some application aspects of virological analysis and diagnostic techniques, with particular attention for the most advanced and innovative methods and more widespread application in the working areas of relevance of the course.

SYLLABUS

Hrs	Frontal teaching
1	Objectives of the course and its subdivision
2	The Microbiology Laboratory: Activities, approach of the worker within the working context, current legislation
3	Pre-analytical phase (Sample collection, Criticality, Transport of the sample, Acceptance or rejection of the sample) - Analytical phase - Post-analytical phase in the Microbiological Diagnosis laboratory
2	Optical microscopes in the microbiological diagnostics laboratory and hints of electron microscopy. Microscopic techniques used in bacteriology: Fresh microscopic examination, simple examination between slides, examination with China ink, prepared in pendant drop.
2	Staining in microbiology: Preparation techniques for prearrates; Dyes, preparation of coloring solutions, types of coloring. Staining techniques, simple staining, differential staining (Gram stain, Ziehl-Neelsen stain, Kinyoun stain, Auramine fluorescence method, capsule staining (India ink), flagella staining (Leifson), spore staining, PAS staining, yeast and fungal staining
2	Culture media: components, classification (Liquid media, Solid media, Coagulated media, Enriched media, Enrichment media, Selective media, Enriched and selective media, Media for the cultivation of anaerobic bacteria). Culture media preparation techniques. Sterilization techniques: Flowing water vapor, saturated water vapor under pressure, heating filtration, UV rays
3	Sowing techniques in liquid soil (sowing by Inoculation, sowing by dilution) Sowing techniques in solid soil (sowing by dissociation, sowing by spatulation, sowing by filtration, sowing by driving, sowing by inclusion) Sowing techniques from some environmental matrices (air, water) Sowing techniques with automated systems most commonly used in microbiology laboratories Evaluation of microbial growth in solid media (phenotypic appearance of colonies) and in liquid media (Fluorescence systems: blood cultures and semi-automated systems for mycobacteria)
3	Bacteria and fungal identification techniques: Classical methods (enzymatic tests, biochemical-metabolic tests, haemolytic activity on blood agar, growth on selective media), commercial kits (Api, enterotube, Micotube, rapid latex agglutination tests), automated systems of use most common in microbiology laboratories (Vitek Biomerieux System, Phoenix BD System, Mass Spectrometry (MS) - MALDI-TOF). Ricerca di antigeni e genomi microbici nei campioni biologici
3	Evaluation of sensitivity to antibacterial drugs: Dilution techniques (tube tests and plate tests); Agar diffusion techniques (Kirby-Bauer - E-test). Automated systems for carrying out the antibiogram. Interpretative criteria - EUCAST.
4	Virological diagnosis techniques: direct diagnosis: Maintenance of cell cultures (primary cultures, secondary cultures (semicontinuous, cell stems), continuous cell lines). Cultivation techniques of viruses from biological samples and observation of cytopathic effect, nuclear-cytoplasmic inclusion bodies, expression of viral Ags, haemadsorption. Virus titration. Techniques for the search for antigens and viral genomes in biological samples
4	Techniques for indirect diagnosis in Microbiology and Virology:: Immunoenzymatic techniques, Chemiluminescence techniques, Immunoblotting, neutralization tests, agglutination tests.

1	Syndromic Tests in Microbiology and Virology
<p style="text-align: center;">MODULE MICROBIOLOGY AND CLINICAL MICROBIOLOGY <i>Prof.ssa SIMONA DE GRAZIA</i></p>	
SUGGESTED BIBLIOGRAPHY	
<p>S. De Grazia, D. Ferraro, G. Giammanco "Microbiologia E Microbiologia Clinica per le professioni sanitarie" – Casa Editrice Pearson ISBN 9788891915825 Pubblicazioni scientifiche inerenti la microbiologia (International literature) Materiale didattico utilizzato durante le lezioni (Didactic material provided during lessons)</p>	
AMBIT	10341-Scienze e tecniche di laboratorio biomedico
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	
<p>Acquire basic knowledge and deepen some application aspects of microbiological analysis and diagnostic techniques, with particular attention to the most advanced and innovative methods and more widespread application in the working areas of relevance of the course. Acquire basic knowledge and deepen some application aspects of virological analysis and diagnostic techniques, with particular attention for the most advanced and innovative methods and more widespread application in the working areas of relevance of the course</p>	

SYLLABUS

Hrs	Frontal teaching
2	Course presentation and Diagnosis of microbial infections
5	Microbial infections of the skin and eyes
4	Microbial infections of the central nervous system
5	Microbial infections of the cardiovascular and lymphatic systems
5	Microbial infections of the respiratory apparatus
5	Microbial infections of the gastrointestinal tract
4	Microbial infections of the urinary and reproductive system