



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2021/2022		
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY		
SUBJECT	MICROBIOLOGY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50401-Patologia generale e molecolare, immunopatologia, fisiopatologia generale, microbiologia e parassitologia		
CODE	05193		
SCIENTIFIC SECTOR(S)	MED/07		
HEAD PROFESSOR(S)	BONURA CELESTINO	Professore Associato	Univ. di PALERMO
	DE GRAZIA SIMONA	Professore Ordinario	Univ. di PALERMO
	FERRARO DONATELLA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	90		
COURSE ACTIVITY (Hrs)	60		
PROPAEDEUTICAL SUBJECTS	03839 - IMMUNOLOGY		
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>BONURA CELESTINO Friday 10:00 11:00 Dipartimento di Promozione della Salute, Materno Infantile, Medicina Interna e Specialistica di Eccellenza "G. D'Alessandro" (PROMISE). Piano 2°</p> <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>FERRARO DONATELLA Tuesday 13:00 14:00 Dipartimento Promozione della salute, Materno Infantile, di Medicina Interna e Specialistica di Eccellenza "G D'Alessandro", Via del Vespro 133, Piano 2° Thursday 13:00 14:00 Dipartimento Promozione della salute, Materno Infantile, di Medicina Interna e Specialistica di Eccellenza "G D'Alessandro", Via del Vespro 133, Piano 2°</p>		

DOCENTE: Prof. CELESTINO BONURA- Sede HYPATIA

PREREQUISITES	The student must have a good knowledge of biochemistry and biology
LEARNING OUTCOMES	<p>Knowledge and understanding of the structural and biological characteristics of microorganisms, the interactions between microorganisms and host with particular reference to the study of pathogens.</p> <p>Ability to apply knowledge and understanding: the student should demonstrate that they have understood the relationships between microorganisms and the host, under normal and pathological conditions, the pathogenic mechanisms by which they cause morbid manifestations and the microbial factors that help maintain homeostasis of the organism.</p> <p>Autonomous judgement: the student should know how to interpret the results of microbiological investigations in relation to the pathological pictures, and will be able to search independently the scientific information supporting the view put forward and the result obtained.</p> <p>Communication skills: the student should acquire the ability to clearly transmit the knowledge acquired both in verbal form that media.</p> <p>Learning skills: the student should develop the learning skills that enable it to continue to study independently by consulting the scientific publications in the field and the analysis of specific topics during interactive meetings.</p>
ASSESSMENT METHODS	<p>Oral exam. The candidate will have to answer at least two questions for each of the microbiology main topics (bacteriology, virology, micology, parasitology), with reference to the recommended texts and didactic material provided. Final assessment aims to evaluate whether the student has knowledge and understanding of the topics, has acquired the skills to interpret the notions and judge independently. The sufficiency threshold will be reached if the student shows knowledge and understanding of the issues at least in broad outline, and has application skills sufficient for the identification of pathogens; he must also have presentation and argumentative skills allowing the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient. The more the candidate will be able to interact with the examiner with his argumentative and presentation skills, and the more his knowledge and application capabilities will go into detail on the subjects under evaluation, the more the judgement will be positive.</p> <p>The evaluation is expressed using a 30-point scale and will take into account the ability to answer questions in the context of pathogenetic relationships between host-microorganism, diagnostic, therapeutic and prophylaxis. ECTS grades: A – A+ Excellent (30-30 cum laude) - Grade descriptors : 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. ECTS grade : B Very good (27-29) - Grade descriptors: 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. ECTS grade: C Good (24-26)- Grade descriptors: Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity ECTS grade: D Satisfactory (21-23)- Grade descriptors: 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. ECTS grade: E Sufficient (18-20) - Grade descriptors: Minimum teaching content knowledge, often limited to the main topic; modest ability to use the subject specific language and independently apply the acquired knowledge. ECTS grade: F Fail (1-17) - Grade descriptors: 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. Exam failed</p>
EDUCATIONAL OBJECTIVES	To acquire biologic and pathogenetic characteristics of pathogens. To know and understand the interactions between microorganisms and host with particular attention to normal and pathological conditions, the route of transmission and the principal pathological pictures. To know characteristics, and mechanism of action of antimicrobial drugs and the main tools for vaccination prophylaxis.. To know the methods of cultivation and identification of microorganisms, the basic knowledge of laboratory methodology for the diagnosis of infections.
TEACHING METHODS	Lectures
SUGGESTED BIBLIOGRAPHY	<p>MICROBIOLOGIA MEDICA- Sherris J.C.- (6a ediz. 2017)- I ediz Italiana 2017</p> <p>PRINCIPI DI MICROBIOLOGIA MEDICA – M. La Placa – 14aed. Ed. Esculapio – EdiSES - 2014</p> <p>MICROBIOLOGIA MEDICA - Murray P.R. - (9a ediz. 2021) - Edra S.p.a.</p>

SYLLABUS

Hrs	Frontal teaching
3	Introduction to microbiology: the impact of microorganisms on humans and on the environment. Structure and functions of cellular microorganism (bacteria, fungi and protozoa) and acellular (viruses).

SYLLABUS

Hrs	Frontal teaching
3	Reproduction of bacteria, fungi, protozoa and viruses.
1	Nutritional factors and metabolism of bacteria, fungi and protozoa
1	Resident microbial populations, microbial ecology
3	Factors of pathogenicity and virulence of microorganisms. Mode of transmission of microorganisms
3	Virus-cell and virus-host relationships.
1	Antimicrobial prophylaxis
5	Antimicrobial drugs. Resistance mechanisms.
2	Methods for microbiological diagnosis and for the evaluation of the activity of antimicrobial drugs
14	Bacteria: Staphylococcus spp; Streptococcus spp; Neisseria spp; Micobacterium spp; Clostridium spp; Enterobacterium spp; Chlamydia spp; Treponema spp.; H.pylori
5	Fungi: Candida; Dimorphic fungi; Dermatophytes; Aspergillus
5	Protozoa: Giardia spp; Trichomonas spp; Leishmania spp; Toxoplasma gondii; Plasmodium spp.
14	Viruses: Herpesvirus; Papillomavirus; Hepadnavirus; Paramyxovirus ; Orthomyxovirus, Picornavirus; Flavivirus; Retroviruses; Human Delta Virus (HDV)

DOCENTE: Prof.ssa DONATELLA FERRARO- Sede *CHIRONE*

PREREQUISITES	The student must have a good knowledge of biochemistry and biology
LEARNING OUTCOMES	<p>Knowledge and understanding: the student should have acquired knowledge and skills understanding of the structural and biological characteristics of microorganisms, the interactions between microorganisms and host with particular reference to the study of pathogens.</p> <p>Ability to apply knowledge and understanding: the student should demonstrate that they have understood the relationships between microorganisms and the host, under normal and pathological conditions, the pathogenic mechanisms by which they cause morbid manifestations and the microbial factors that help maintain homeostasis of the organism.</p> <p>Autonomous judgement: the student should know how to interpret the results of microbiological investigations in relation to the pathological pictures, and will be able to search independently the scientific information supporting the view put forward and the result obtained.</p> <p>Communication skills: the student should acquire the ability to clearly transmit the knowledge acquired both in verbal form that media.</p> <p>Learning skills: the student should develop the learning skills that enable it to continue to study independently by consulting the scientific publications in the field and the analysis of specific topics during interactive meetings.</p>
ASSESSMENT METHODS	<p>Oral exam. The candidate will have to answer at least two questions for each of the microbiology main topics (bacteriology, virology, micology, parasitology), with reference to the recommended texts and didactic material provided. Final assessment aims to evaluate whether the student has knowledge and understanding of the topics, has acquired the skills to interpret the notions and judge independently. The sufficiency threshold will be reached if the student shows knowledge and understanding of the issues at least in broad outline, and has application skills sufficient for the identification of pathogens; he must also have presentation and argumentative skills allowing the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient. The more the candidate will be able to interact with the examiner with his argumentative and presentation skills, and the more his knowledge and application capabilities will go into detail on the subjects under evaluation, the more the judgement will be positive.</p> <p>The evaluation is expressed using a 30-point scale. ECTS grades: A – A+ Excellent (30-30 cum laude) - Grade descriptors : 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. ECTS grade : B Very good (27-29) - Grade descriptors: 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. ECTS grade: C Good (24-26)- Grade descriptors: Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity ECTS grade: D Satisfactory (21-23)- Grade descriptors: 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. ECTS grade: E Sufficient (18-20) - Grade descriptors: Minimum teaching content knowledge, often limited to the main topic; modest ability to use the subject specific language and independently apply the acquired knowledge. ECTS grade: F Fail (1-17) - Grade descriptors: 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. Exam failed.</p>
EDUCATIONAL OBJECTIVES	To acquire biologic and pathogenetic characteristics of pathogens. To know and understand the interactions between microorganisms and host with particular attention to normal and pathological conditions, the route of transmission and the principal pathological pictures. To know characteristics and mechanism of action of antimicrobial drugs. To know the methods of cultivation and identification of microorganisms, the basic knowledge of laboratory methodology for the diagnosis of infections.
TEACHING METHODS	Lectures
SUGGESTED BIBLIOGRAPHY	<p>MICROBIOLOGIA MEDICA - Murray P.R., Pfaller M.A., Rosenthal K.S.- NONA EDIZIONE Edra - Masson - 2021</p> <p>MICROBIOLOGIA MEDICA- Sherris J.C.- (6a ediz. 2017)- I ediz Italiana 2017</p> <p>PRINCIPI DI MICROBIOLOGIA MEDICA – M. La Placa – 14a ed. Ed. Esculapio – EdiSES - 2014</p> <p>PRINCIPI DI MICROBIOLOGIA MEDICA - G. ANTONELLI, M CLEMENTI, G. POZZI, GM. ROSSOLINI - 3a ed - ZANICHELLI 2018</p>

SYLLABUS

Hrs	Frontal teaching
3	Introduction to microbiology: the impact of microorganisms on humans and on the environment. Structure and functions of cellular microorganism (bacteria, fungi and protozoa) and acellular (viruses).

SYLLABUS

Hrs	Frontal teaching
3	Mechanisms of replication of bacteria, fungi, protozoa and viruses.
1	Metabolism and environmental factors and influencing microbial growth
1	Microbioma and microbial ecology
3	Pathogenicity factors and virulence of microorganisms. Route of transmission of microorganisms
3	Virus-cell and virus-host interactions
1	Antimicrobial prophylaxis
5	Antimicrobial agents and resistance mechanisms
2	Diagnostic methods for the identification of microorganisms in biological samples and for the valuation of drugs antimicrobial activity
14	Bacteria: Staphylococcus spp; Streptococcus spp; Neisseria spp; Micobacterium spp; Clostridium spp; Enterobacterium spp; Haemophylus spp; Brucella spp; Chlamydia spp; Rickettsia spp; Treponema spp
5	Fungi: Candida; Cryptococcus; Dermatophytes, Aspergillus
5	Protozoa: Giardia spp; Trichomonas spp; Leishmania spp; Toxoplasma gondii; Plasmodium spp
14	Viruses: Herpesvirus; Papillomavirus; Hepadnavirus; Paramyxovirus ; Orthomyxovirus, Picornavirus; Flavivirus; Retroviruses; Human Delta Virus (HDV)

DOCENTE: Prof.ssa SIMONA DE GRAZIA- Sede IPPOCRATE

PREREQUISITES	The student must have a good knowledge of biology and genetics
LEARNING OUTCOMES	<p>Knowledge and understanding: the student should have acquired knowledge and skills understanding of the structural and biological characteristics of microorganisms, the interactions between microorganisms and host with particular reference to the study of pathogens.</p> <p>Ability to apply knowledge and understanding: the student should demonstrate that they have understood the relationships between microorganisms and the host, under normal and pathological conditions, the pathogenic mechanisms by which they cause morbid manifestations and the microbial factors that help maintain homeostasis of the organism.</p> <p>Autonomous judgement: the student should know how to interpret the results of microbiological investigations in relation to the pathological pictures, and will be able to search independently the scientific information supporting the view put forward and the result obtained.</p> <p>Communication skills: the student should acquire the ability to clearly transmit the knowledge acquired both in verbal form that media.</p> <p>Learning skills: the student should develop the learning skills that enable it to continue to study independently by consulting the scientific publications in the field and the analysis of specific topics during interactive meetings</p>
ASSESSMENT METHODS	<p>Oral exam. The candidate will have to answer at least two questions for each of the microbiology main topics (bacteriology, virology, micology, parasitology), with reference to the recommended texts and didactic material provided. Final assessment aims to evaluate whether the student has knowledge and understanding of the topics, has acquired the skills to interpret the notions and judge independently. The sufficiency threshold will be reached if the student shows knowledge and understanding of the issues at least in broad outline, and has application skills sufficient for the identification of pathogens; he must also have presentation and argumentative skills allowing the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient. The more the candidate will be able to interact with the examiner with his argumentative and presentation skills, and the more his knowledge and application capabilities will go into detail on the subjects under evaluation, the more the judgement will be positive.</p> <p>The evaluation is expressed using a 30-point scale. ECTS grades: A – A+ Excellent (30-30 cum laude) - Grade descriptors : 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. ECTS grade : B Very good (27-29) - Grade descriptors: 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. ECTS grade: C Good (24-26)- Grade descriptors: Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity ECTS grade: D Satisfactory (21-23)- Grade descriptors: 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. ECTS grade: E Sufficient (18-20) - Grade descriptors: Minimum teaching content knowledge, often limited to the main topic; modest ability to use the subject specific language and independently apply the acquired knowledge. ECTS grade: F Fail (1-17) - Grade descriptors: 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. Exam failed.</p>
EDUCATIONAL OBJECTIVES	To acquire biologic and pathogenetical characteristics of pathogens. To know and understand the interactions between microorganisms and host with particular attention to normal and pathological conditions, the route of transmission and the principal pathological pictures. To know characteristics and mechanism of action of antimicrobial drugs. To know the methods of cultivation and identification of microorganisms, the basic knowledge of laboratory methodology for the diagnosis of infections.
TEACHING METHODS	Lectures
SUGGESTED BIBLIOGRAPHY	<p>MICROBIOLOGIA MEDICA - Murray P.R., Pfaller M.A., Rosenthal K.S.- NONA EDIZIONE Edra - Masson - 2021</p> <p>MICROBIOLOGIA MEDICA- Sherris J.C.- (6a ediz. 2017)- I ediz Italiana 2017</p> <p>PRINCIPI DI MICROBIOLOGIA MEDICA – M. La Placa – 14aed. Ed. Esculapio – EdiSES - 2014</p> <p>PRINCIPI DI MICROBIOLOGIA MEDICA – G. Antonelli, M. Clementi, G. Pozzi, GM. Rossolini – III Ed. Zanichelli- 2018</p>

SYLLABUS

Hrs	Frontal teaching
3	Introduction to microbiology: the impact of microorganisms on humans and on the environment. Structure and functions of cellular microorganism (bacteria, fungi and protozoa) and acellular (viruses).

SYLLABUS

Hrs	Frontal teaching
3	Mechanisms of replication of bacteria, fungi, protozoa and viruses.
1	Metabolism and environmental factors and influencing microbial growth
1	Microbioma and microbial ecology
3	Pathogenicity and virulence factors of microorganisms. Route of transmission of microorganisms
4	Virus-cell and virus-host interactions. Antimicrobial prophylaxis.
5	Antimicrobial agents and resistance mechanisms.
2	Diagnostic methods for the identification of microorganisms in biological samples and for the valuation of drugs antimicrobial activity
14	Bacteria: Staphylococcus spp; Streptococcus spp; Neisseria spp; Micobacterium spp; Clostridium spp; Enterobacterium spp; Haemophylus spp; Brucella spp; Chlamydia spp; Rickettsia spp; Treponema spp; Helicobacter pylori
5	Fungi: Candida; Aspergillus; Dimorphic fungi; Dermatophytes
5	Protozoa: Giardia spp; Trichomonas spp; Leishmania spp; Toxoplasma gondii; Plasmodium spp.
14	Viruses: Herpesvirus; Papillomavirus; Hepadnavirus; Paramyxovirus; Orthomyxovirus; Picornavirus; Flavivirus; Retroviruses; Human Delta Virus (HDV).