UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: MICROBIOLOGY I
Code: 14320
Type: CORE COURSE
ECTS credits: 6
Degree: 376 - UNDERGRADUATE DEGREE PROGRAMME IN PHARMACY
Academic year: 2023-24
Center: 14 - FACULTY OF PHARMACY
Group(s): 10
Year: 3
Duration: First semester
Main language: Spanish
Second language: English
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **PILAR CLEMENTE CASARES** - Group(s): **10**

Building/Office	Department	Phone number	Email	Office hours
Farmacia (Despacho 1.11.01)/CRIB	CIENCIAS MÉDICAS	8242	pilar.ccasares@uclm.es	

Lecturer: **PETRUS WILHELMUS JOHANNES DE GROOT ---** - Group(s): **10**

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Lecturer: **ANTONIO MAS LOPEZ** - Group(s): **10**

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2. Pre-Requisites

The student must consider that in order to pass this subject he / she should have previously completed and passed the subjects of previous courses. The student must have previous knowledge of Biology.

3. Justification in the curriculum, relation to other subjects and to the profession

The subject MICROBIOLOGY I will present and give the student the general theoretical-practical bases for knowledge and recognition of microorganisms. Their generalities, morphologies, metabolisms, their own locations or habitats and their interactions with the surrounding environment. It will also allow you to know the methodological and practical bases of manipulation in a laboratory of microbiology, basic classification, and control of the growth of microorganisms in the laboratory.

The subject MICROBIOLOGY I, together with MICROBIOLOGY II and PARASITOLOGY, constitutes the base of microbiological knowledge essential for the knowledge and development of therapeutic strategies for the control of microorganisms.

4. Degree competences achieved in this course

Course competences

Code	Description
B01	Proficiency in a second foreign language at level B1 of the Common European Framework of Reference for Languages.
B02	Knowledge of Information and Communication Technologies (ICT).
B03	A correct oral and written communication
B04	Ethical commitment and professional deontology.
B05	Ability to develop those learning skills necessary to undertake further studies.
EB01	Know the structures of biomolecules and their transformations into the cell.
EB03	Estimate the biological risks associated with the use of substances and processes of laboratories involved.
EB04	Understand the relationship between the life cycle of infectious agents and the properties of active principles.
EB05	Develop skills to identify therapeutic targets and biotechnological production of drugs, as well as the use of gene therapy.
EB06	Know and understand the microbiological control of medications
EB08	Know the nature and behavior of infectious agents.
EB09	Know the main metabolic pathways involved in the degradation of drugs.
EB11	Know how the nature and behavior of infectious agents determine the type of immune response.
EM02	Know and fully understand the basic fundamentals of clinical analysis, as well as the characteristics and contents of the laboratory diagnosis specifications
EM03	Develop hygienic-sanitary analysis (biochemical, bromatological, microbiological, parasitological) related to health, food and the environment.
EM04	Study the effects of substances with pharmacological activity.
EM07	Promote the rational use of medicines and health products.
EM15	Know the analytical techniques related to laboratory diagnosis, toxic, food and environment determinations.
G01	Identify, design, obtain, analyze, control and produce drugs and medicines, as well as other products and raw materials of sanitary interest for human or veterinary use.
G03	Know how to apply the scientific method and acquire skills in the handling of legislation, sources of information, bibliography, elaboration of protocols and other aspects considered necessary for the design and critical evaluation of preclinical and clinical trials.

G04	Design, prepare, supply and dispense medicines and other products of health interest.
G05	Provide therapeutic advice in pharmacotherapy and dietotherapy, as well as in the nutritional and food field in the establishments where they provide services.
G06	Promote the rational use of medicines and medical devices, as well as to acquire basic knowledge in clinical management, health economics and the efficient use of health resources.
G07	Identify, evaluate and assess problems related to drugs and medicines, as well as participate in pharmacovigilance activities.
G10	Design, apply and evaluate clinical reagents, methods and analytical techniques, knowing the basic principles of clinical analysis and the characteristics and contents of laboratory diagnostic reports.
G12	Develop hygienic-sanitary analyses, especially those related to food and environment.
G13	Develop communication and information skills, both oral and written, to deal with patients and users of the centre where they carry out their professional activity. Promote the capacity to work and collaborate with multidisciplinary teams and those related to other health professionals.
G15	Recognise own limitations and the need to maintain and update professional competence, with particular emphasis on self-learning of new knowledge based on scientific evidence.
T01	Critical thinking skills based on the application of the scientific method
T02	Ability to manage quality scientific information, bibliography, specialized databases and resources accessible through the Internet.
T03	Handling of basic and specific software for the treatment of information and experimental results.
T04	Motivation for quality, safety at work and awareness of environmental issues, with knowledge of the internationally recognised systems for the correct management of these aspects.
T05	Organizational, planning and implementation skills.
T06	Ability to address human resources decision-making and management.
T07	Ability to work as a team and, where appropriate, exercise leadership functions, encouraging entrepreneurship.
T08	Develop interpersonal skills and the ability to function in an international and multicultural context.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge of the biotechnological applications of micro-organisms and their genetic manipulation.

Knowledge of the main infectious diseases and their etiological agents, transmission routes and epidemiological control.

Knowledge of the application criteria and protocols for sterilization, disinfection and antisepsis.

Ability to know the main groups of microorganisms and understand the importance of their relationship with human beings.

Acquisition of microbiological criteria to select appropriate antimicrobials for the treatment of infectious diseases, promoting their rational use.

Acquisition of practical experience in the observation, culture and identification of microorganisms.

Ability to interpret and produce microbiological reports.

Ability to perform and interpret microbiological and quality control analyses in the health, agri-food and industrial fields.

Ability to conduct and interpret antimicrobial susceptibility testing.

Ability to produce and interpret reports on analytical techniques for the diagnosis of infectious diseases.

Knowledge of vaccine use criteria.

Proper laboratory handling of microorganisms.

6. Units / Contents

Unit 1: Introduction to microbiology. Methods of observation and structure of microorganisms.

Unit 2: Nutrition, metabolism, growth and control of microorganisms.

Unit 3: Microbial genetics, genetic engineering and genomics.

Unit 4: Microbial diversity and taxonomy: bacteria, viruses and fungi.

Unit 5: Bases of the microorganism-host interaction.

Unit 6: Antimicrobial drugs: mechanisms of action and resistance.

Unit 7: Microbial ecology.

Unit 8: Industrial microorganisms and their biotechnological applications.

Unit 9: Organization of the Clinical Microbiology laboratory. Protocols of analysis, quality control and biological risks.

Unit 10: Diagnosis of infectious diseases. Analytical methodology used in the clinical microbiology laboratory: microbiological, immunological and molecular techniques.

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	B01 B02 B03 B04 B05 EB01 EB03 EB04 EB05 EB06 EB08 EB09 EB11 EM02 EM03 EM04 EM07 EM15 G01 G03 G04 G05 G06 G07 G10 G12 G13 G15 T01 T02 T03 T04 T05 T06 T07 T08	0.8	20	Y	Y	Hands-on teaching will be performed in small groups within periods established in the academic calendar and that do not coincide with other teaching activities. They will be carried out in classrooms and/or laboratories, all of them equipped with the appropriate equipment to achieve the proposed objectives. These activities are MANDATORY, so the student will not be able to pass the course if they are not carried out properly.
		B01 B02 B03 B04 B05 EB01 EB03 EB04 EB05 EB06 EB08 EB09 EB11					Teaching resources will be accessible on the Moodle platform before the beginning of the activities.

Class Attendance (theory) [ON-SITE]	Combination of methods	EM02 EM03 EM04 EM07 EM15 G01 G03 G04 G05 G06 G07 G10 G12 G13 G15 T01 T02 T03 T04 T05 T06 T07 T08	1.44	36	Y	N	In addition, students will have access to complementary bibliographic and audiovisual material (books, review articles, videos) in the university library of the Albacete campus.
Study and Exam Preparation [OFF-SITE]	Self-study	B01 B02 B03 B04 B05 EB11 EM15 G01 G03 G04 G05 G06 G07 G10 G12 G13 G15 T01 T02 T03 T04 T05 T06 T07 T08	3.6	90	Y	N	The student may request personal counseling on the contents of the course by previously arranging an interview with the corresponding professor.
Formative Assessment [ON-SITE]	Assessment tests		0.16	4	Y	Y	
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4					**Total class time hours: 60**
		Total credits of out of class work: 3.6					**Total hours of out of class work: 90**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Laboratory sessions	20.00%	20.00%	
Oral presentations assessment	10.00%	0.00%	
Test	70.00%	80.00%	
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The subject will be passed when at least 5 POINTS are obtained in the overall score and THEORETICAL AND PRACTICAL MODULES HAVE BEEN PREVIOUSLY SURPASSED.

- Theoretical evaluation: corresponds to 70% of the final grade of the subject. There will be two tests throughout the course and each of them will be worth 35% of the final grade of the subject. In both cases theoretical concepts, topics covered in the practices or in the different teaching activities, seminars, problems, clinical cases, etc. may be included.

- Practical evaluation: it will be carried out by means of evaluation (practical notebook and resolution of issues, problems, etc.) at the end of each practical session. The obtained qualification will suppose 20% of the final qualification of the subject. The practice note for subsequent enrollments will not be saved. Laboratory practices are a mandatory non-recoverable activity and whoever does not do them will not pass the subject.

To pass the subject the student must have passed both the theoretical and practical assessment.

- Evaluation of participation: corresponds to 10% of the final grade of the subject and will assess oral presentations. It will only be taken into account once the theoretical and practical block has been overcome.

Non-continuous evaluation:

Evaluation criteria not defined

Specifications for the resit/retake exam:

- To pass this subject it is essential to have attended the activities that are mandatory.

- The resit exam will consist of the performance of evaluation tests about the contents of the subject described in the table above.

Specifications for the second resit / retake exam:

To overcome this subject it is essential to have attended the activities that are mandatory.
- Only students who meet the requirements set out in the Student Assessment Regulations of the University of Castilla-La Mancha will be able to access this call. They will be evaluated according to the criteria applied in the extraordinary call.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	20
Class Attendance (theory) [PRESENCIAL][Combination of methods]	36
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Formative Assessment [PRESENCIAL][Assessment tests]	4

Global activity

Activities	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	36
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	20
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Formative Assessment [PRESENCIAL][Assessment tests]	4
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
M.T. Madigan	Brock. Biología de los microorganismos.	Pearson		978-84-7829-097-0	2009	
P.R. Murray	Microbiología médica	Elsevier		978-0-323-05470-6	2009	
PELCZAR, Michael J.	Elementos de microbiologia	McGraw-Hill		84-85240-76-6	1984	
Prats Pastor, Guillermo	Microbiologia clínica	Editorial Médica Panamericana		978-84-7903-971-4	2008	
S.J. Flint	Principles of virology.	ASM press		1-55581-259-7	2004	
W.J. Thieman	Introducción a la biotecnología	Pearson		978-84-7829-117-5		
	Enfermedades infecciosas y microbiologia clinica	Doyma		0213-005X	1984	
	Microbiologia y parasitologia medica	Masson Salvat		84-458-0060-4	1995	