



Teaching Guide

Teaching Guide				
Identifying Data			2020/21	
Subject (*)	Microbiology	Code	610G02015	
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatory	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía			
Coordinador	Herrero Lopez, Maria Concepcion	E-mail	concepcion.herrero@udc.es	
Lecturers	Cid Blanco, Angeles Fidalgo Paredes, Pablo Herrero Lopez, Maria Concepcion Poza Domínguez, Margarita	E-mail	angeles.cid@udc.es pablo.fidalgo@udc.es concepcion.herrero@udc.es margarita.poza.dominguez@correo.udc.es	
Web				
General description	Compulsory subject of the Degree in Biology. It introduces students to the basic concepts of Microbiology, both theoretical and practical: structure of microorganisms; bacterial physiology; introduction to Virology; microbial genetics; phylogeny and systematics of microorganisms. It is the basis for other subjects in the same field, either compulsory or optional. It is complemented with other subjects of the Degree, such as Biochemistry, Genetics, Ecology, etc.			
Contingency plan	1. Modifications to the contents None 2. Methodologies *Teaching methodologies that are maintained None *Teaching methodologies that are modified Master class and seminars: telematic teaching by means of Teams Laboratory practices: if the practices cannot be carried out in person, they will be replaced by telematic alternatives related to the corresponding subject matter. 3. Mechanisms for personalised attention to students Microsoft Teams: Personal and group attention (video, audio or chat) when students ask questions; also on demand from teachers. Moodle: Document repository and help in teaching, also for notifications and communication with students through the forum. Email: Personalized and group attention to questions required by students, as well as notifications from teachers Telephone: Two-way personalized attention required by both participants. 4. Modifications in the evaluation *Evaluation observations: All attendance tests are now telematic and the percentages are amnestied 5. Modifications to the bibliography or webgraphy Not applicable Translated with www.DeepL.com/Translator (free version)			



Study programme competences	
Code	Study programme competences
A1	Recoñecer distintos niveis de organización nos sistemas vivos.
A2	Identificar organismos.
A4	Obter, manexar, conservar e observar espécimes.
A13	Realizar o illamento e cultivo de microorganismos e virus.
A15	Deseñar e aplicar procesos biotecnolóxicos.
A21	Deseñar modelos de procesos biolóxicos.
A29	Impartir coñecementos de Bioloxía.
A30	Manexar adecuadamente instrumentación científica.
A31	Desenvolverse con seguridade nun laboratorio.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar en colaboración.
B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B12	Adaptarse a novas situacións.

Learning outcomes			
Learning outcomes		Study programme competences	
Coñecemento teórico e práctico dos microorganismos nos seus aspectos básicos		A1	B1
Coñecementos básicos sobre a estrutura e fisioloxía dos microorganismos, así como as bases metodolóxicas para o estudo dos mesmos		A2	B2
		A4	B3
		A13	B4
		A15	B5
		A21	B6
		A29	B7
		A30	B8
		A31	B9
			B12

Contents	
Topic	Sub-topic
Section I: : Introduction to Microbiology	1.- Members of the Microbial World. History of Microbiology. Importance of the microorganisms 2.- Microbial diversity. The Three Domains: Bacteria, Archaea and Eukarya. Viruses. The species concept in Microbiology. Nomenclature
SECTION II: Prokaryotic cell structure	3.- Cell shape and size. Bacterial cell wall 4.- Bacterial protoplast 5.- Cell surface structures in bacteria 6.- Bacterial endospores 7.- Archaeal cell morphology and structure



SECTION III: Microbial nutrition, metabolism and growth	<p>8.- Nutrition and culture of microorganisms. Nutritional types. Nutrient sources. Culture media.</p> <p>9.- Essentials of microbial metabolism. Diversity of metabolic processes to obtain energy in microorganisms</p> <p>10.- Energy utilization. Regulation</p> <p>11.- Microbial growth: cell division and population growth. Measurement of microbial growth.</p> <p>12.- Effect of environmental factors on microbial growth</p>
SECTION IV: Virology	<p>13.- Overview of Virology</p> <p>14.-Bacterial viruses</p> <p>15.- Animal viruses. Viruses and cancer. Antiviral chemotherapy</p> <p>16.- Plant viruses. Subviral entities</p>
SECTION V: Microbial genetics	<p>17.- Mutation</p> <p>18.- Genetic elements in bacteria</p> <p>19.- Gene transfer in bacteria and archaea: transformation, transduction and conjugation</p>
SECTION VI: Microbial evolution and systematics	<p>20.- Microbial evolution</p> <p>21.- Microbial systematics. Classification and identification</p> <p>22.- Domain Archaea</p> <p>23.- Domain Bacteria</p> <p>24.- Protists</p>
LABORATORY PRACTICE	<ul style="list-style-type: none"> - Observation of microorganisms. Staining techniques - Preparation of culture media - Laboratory culture of microorganisms. Obtention of pure cultures - Normal microbiota - Growth curve - Identification of microorganisms

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Guest lecture / keynote speech	A1 A15 A21 A29 B1 B3 B6 B8 B9	30	75	105
Laboratory practice	A2 A4 A13 A29 A30 A31 B1 B2 B4 B5 B6 B12	15	9	24
Mixed objective/subjective test	A1 B1 B2 B3 B4 B8 B9	3	0	3
Seminar	B1 B2 B3 B4 B5 B6 B7 B8 B9	4	9	13
Personalized attention		5	0	5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Guest lecture / keynote speech	Lectures presented by the teaching staff concerning the theoretical bases of the subject
Laboratory practice	<p>Compulsory attendance.</p> <p>They include experimental work related to theoretical concepts explained in guest lectures and seminars</p> <p>Students will be able to perform the basic processes and techniques used in Microbiology</p>



Mixed objective/subjective test	The degree of knowledge and understanding achieved by the student will be assessed in a written exam
Seminar	Theoretical and/or practical seminars, related to the contents of the subject. They are conceived as a reinforcement of the topics covered in classes and laboratory to stimulate the continuous learning of the student. They will be assessed in the mixed test, but specific assessments can be set.

Personalized attention

Methodologies	Description
Laboratory practice	During the development of the subject, the teachers will take care of the needs and queries of the student related to the subject, providing the guidance and support required, both in person and on-line.
Seminar	
Mixed objective/subjective test	Exam preparation sessions can be included, as well as the subsequent revision of the exam

Assessment

Methodologies	Competencies	Description	Qualification
Laboratory practice	A2 A4 A13 A29 A30 A31 B1 B2 B4 B5 B6 B12	Compulsory attendance. Continuous assessment during the development of the lab work (5%). Exam (15%) If the student does not attend the lab practices, he/she will not pass the subject	20
Mixed objective/subjective test	A1 B1 B2 B3 B4 B8 B9	Written test about the knowledge acquired in the lectures and seminars. It will not exceed 80% of the total grade of the course During the development of the material, several short examinations will be carried out in person. For students who do not take these exams, a comprehensive classroom exam will be held on the date scheduled for the final exam.	80

Assessment comments



Attendance to laboratory practices is compulsory to pass the subject.

If the student does not attend the lab practices, he/she will not pass the subject; therefore they cannot do the mix test.

To pass the subject, both practices and written exam must be passed.

To pass the practices, besides the attendance, the student must pass a specific exam.

"NO PRESENTADO" mark is obtained when the student do not do the written exam (mixed test).

As a part of the continuous evaluation, the progression of the student throughout the semester will be taken into consideration with a maximum of 1 point.

If the student does not pass the subject at the first opportunity, he/she must overcome the unapproved part at the second chance. If it is the theory, the student must repeat the mixed test. If practical exam is not passed, the student must repeat it.

The highest grade "Matricula de Honor" will be mainly given to students that pass the subject in the "First Opportunity". And it will only be given in the so-called "second Opportunity" if there are still any available.

In the case of very special and exceptional circumstances, adequately justified, the teacher can totally or partially exempts the student from part of the evaluation process. This student will then have to go through an examination process where he/she will need to clearly proof his/her level of knowledge, competence, capabilities and skills.

Sources of information

- | Sources of information | |
|------------------------|--|
| Basic | <ul style="list-style-type: none">- MADIGAN, M., MARTINKO, J., BENDER, K., BUCKLEY, D. y STAHL, D. (2015). Brock Biología de los Microorganismos. 14ª ed. . Pearson Educación S.A.- Martín, A., Béjar, V., Gutiérrez, J.C., Llagostera, M y Quesada, E (2019). Microbiología Esencial. Panamericana- Tortora, G.J., Funke, B. R. and Case, C.L (2017). Introducción a la Microbiología 12ª Ed. Panamericana- WILLEY, J.M., SHERWOOD, L.M. and WOOLVERTON, C.J. (2009). Microbiología de Prescott, Harley y Klein. McGraw Hill- WILLEY, J.M., SHERWOOD, L.M. and WOOLVERTON, C.J. (2014). Prescott's Microbiology 9th ed. McGraw Hill |
| Complementary | |

Recommendations

Subjects that it is recommended to have taken before

Chemistry/610G02001

Biology: Basic Levels of Organisation of Life I (Cells)/610G02007

Biochemistry I/610G02011

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Applied Microbiology and Microbiological Control/610G02016

Microbiology Techniques/610G02017

Microbiology and Environmental Biotechnology/610G02018

Other comments



Power point presentations uploaded in Moodle constitute a guide for the study of the themes, but in no case they include the overall contents of these themes

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.