



Teaching Guide				
Identifying Data				2016/17
Subject (*)	Microbioloxía	Code	610G02015	
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatoria	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía Celular e Molecular			
Coordinador	Herrero Lopez, Maria Concepcion	E-mail	concepcion.herrero@udc.es	
Lecturers	Cid Blanco, Angeles Esperanza Llera, Marta Fidalgo Paredes, Pablo Herrero Lopez, Maria Concepcion Seoane Méndez, Marta	E-mail	angeles.cid@udc.es marta.esperanza@udc.es pablo.fidalgo@udc.es concepcion.herrero@udc.es marta.seoane@udc.es	
Web				
General description	Materia obrigatoria do grao en Bioloxía. Inicia ao alumnado nos conceptos básicos de Microbioloxía, tanto teóricos como prácticos: estrutura de microorganismos; fisioloxía bacteriana; introdución á Viroloxía; xenética microbiana; filoxenia e sistemática de microorganismos. Serve de base para cursar posteriormente outras materias da área, tanto obrigatorias como optativas. Complementábase con outras materias do Grao, como Bioquímica, Xenética, Ecoloxía, etc.			

Study programme competences / results	
Code	Study programme competences / results
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 / results



Coñecemento teórico e práctico dos microorganismos nos seus aspectos básicos Coñecementos básicos sobre a estrutura e fisioloxía dos microorganismos, así como as bases metodolóxicas para o estudo dos mesmos	A1	B1
	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	8.- Nutrition and culture of microorganisms. Nutritional types. Nutrient sources. Culture media. 9.- Essentials of microbial metabolism. Metabolic diversity 10.- Microbial growth: cell division and population growth. Measurement of microbial growth. 11.- Effect of environmental factors on microbial growth
SECTION IV: Virology	12.- Overview of Virology 13.-Bacterial viruses 14.- Animal viruses. Viruses and cancer. Antiviral chemotherapy 15.- Plant viruses. Subviral entities
SECTION V: Microbial genetics	16.- Regulation of gene expression 17.- Genetic elements in bacteria. Mutation 18- Gene transfer in bacteria and archaea: transformation, transduction and conjugation
SECTION VI: Microbial evolution and systematics	19.- Microbial evolution 20.- Microbial systematics. Classification and identification 21.- Domino Archaea 22.- Dominio Bacteria
LABORATORY PRACTICE	- 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 / Results	Teaching hours (in-person & virtual)	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	Compulsory attendance. They include experimental work related to theoretical concepts explained in guest lectures and seminars Students will be able to perform the basic processes and techniques used in Microbiology
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 Seminar Mixed objective/subjective test	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. Exam preparation sessions can be included, as well as the subsequent revision of the exam

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Guest lecture / keynote speech	A1 A15 A21 A29 B1 B3 B6 B8 B9	A written exam is made to assess the level of knowledge achieved.	0
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
Seminar	B1 B2 B3 B4 B5 B6 B7 B8 B9	Computed on the mixed test but specific assessments can be set. It accounts until 10% of the final mark	10
Mixed objective/subjective test	A1 B1 B2 B3 B4 B8 B9	Written exam to assess the degree of knowledge and understanding achieved by the student It accounts until 70% of the final mark.	70



## 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

<b>Basic</b>	<ul style="list-style-type: none"> <li>- MADIGAN, M., MARTINKO, J., BENDER, K., BUCKLEY, D. y STAHL, D. (2015). Brock Biología de los Microorganismos . Pearson Educación S.A.</li> <li>- WILLEY, J.M., SHERWOOD, L.M. and WOOLVERTON, C.J. (2009). Microbiología de Prescott, Harley y Klein. McGraw Hill</li> <li>- WILLEY, J.M., SHERWOOD, L.M. and WOOLVERTON, C.J. (2014). Prescott's Microbiology. McGraw Hill</li> </ul> <p> <a href="http://microbewiki.kenyon.edu/index.php/MicrobeWiki">http://microbewiki.kenyon.edu/index.php/MicrobeWiki</a> <a href="http://www.semirobiologia.org/">http://www.semirobiologia.org/</a>  <a href="http://www.asm.org/http://microbewiki.kenyon.edu/index.php/MicrobeWiki">http://www.asm.org/http://microbewiki.kenyon.edu/index.php/MicrobeWiki</a> <a href="http://www.semirobiologia.org/">http://www.semirobiologia.org/</a>  <a href="http://www.asm.org/">http://www.asm.org/</a> </p>
<b>Complementary</b>	

## Recommendations

### Subjects that it is recommended to have taken before

Química/610G02001

Citología/610G02007

Bioquímica: Bioquímica I/610G02011

### Subjects that are recommended to be taken simultaneously

### Subjects that continue the syllabus

Microbiología aplicada e control microbiolóxico/610G02016

Técnicas en Microbiología/610G02017

Microbiología e biotecnología ambiental/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.