Teaching Guide				
Identifying Data				2022/23
Subject (*)	Biology: Basic Levels of Organisation of Life I (Cells)		Code	610G02007
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	First	Basic training	6
Language	SpanishGalicianEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía			
Coordinador	Yañez Sanchez, Julian	E-mail	julian.yanez@udc.es	
Lecturers	Rey Rico, Ana Vaamonde García, Carlos Yañez Sanchez, Julian	E-mail	ana.rey.rico@udc.es carlos.vaamonde.garcia@udc.es julian.yanez@udc.es	
Web				
General description	This subject is in the first academic year of the degree and the only precedent that holds the majority of national students are knowledge from the Biology course of secondary education. Therefore, because this course is included in the basic common core, teaching is included in the first semester of the first course to provide students with the basic skills needed for other subjects. The course focuses on the study of the cell as the anatomical and functional unit of both unicellular and multicellular living beings, with special emphasis on the eukaryotic cell. The structure, function and biogenesis of its components as well as the mechanism and function of the main cellular activities will be treated in an integrated manner.			

Study programme competences	
Code	Study programme competences
A1	Recoñecer distintos niveis de organización nos sistemas vivos.
A4	Obter, manexar, conservar e observar especímenes.
A5	Analizar e caracterizar mostras de orixe humana.
A11	Identificar e analizar material de orixe biolóxica e as súas anomalías.
A26	Deseñar experimentos, obter información e interpretar os resultados.
A30	Manexar adecuadamente instrumentación científica.
A31	Desenvolverse con seguridade nun laboratorio.
B1	Aprender a aprender.
B4	Traballar de forma autónoma con iniciativa.
B6	Organizar e planificar o traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B10	Exercer a crítica científica.
B11	Debater en público.
B13	Comportarse con ética e responsabilidade social como cidadán e como profesional.

Learning outcomes			
Learning outcomes	Study programme competences		
To know the characteristics and properties of the different cell types as anatomical and functional units of living organisms, their possible origin and interrelationship	A1	B1 B4 B9 B11	

To know the structure, origin and function of cellular components, with particular emphasis on eukaryotic cells	A1 A4	B4 B9 B11	
To understand the mechanisms underlying the dynamics of life and social processes of cells	A1	B4 B9 B11	
To understand and become familiar with the methodologies, bibliographic sources and technical terms of Cell Biology, in some cases using the scientific method to study	A1 A4 A5 A11 A26 A30 A31	B6 B8 B10 B13	

Contents	
Topic	**Sub-topic**
INTRODUCTION:	Concept and historical background of Cell Biology. Organization levels and clasification of life. Cell Biology Methods.
CELL MEMBRANE AND CELL SURFACE	Structure and organization of biological membranes. Transport of molecules across the membrane. The cell surface. Cell adhesion and cellular junctions.
CYTOSOL AND CYTOSKELETON	Cytosol. Cytoskeleton. Complex microtubular structures.
SYNTHESIS, INTRACELLULAR TRAFFIC AND DEGRADATION OF MACROMOLECULES	Ribosomes The endoplasmic reticulum The Golgi complex Lisosomes
THE ENERGY CONVERSION	Mitohondria Plastids Microbodies
THE CELL NUCLEUS AND THE EUKARYOTIC GENOME ORGANIZATION	The cell nucleus Chromatin Chromosomes
THE CELL CYCLE	The cell cycle Mitosis and cytokinesis Meiosis The programmed cell death.
THE SOCIAL CONTEXT OF THE CELL	Cell communication and cell signaling Cancer

Practical lessons	- Fundamentals of light microscopy - Observation of bacteria and fungi - Observation of protozoans (Protista) and animal cells - Observation of plant cells - Cell Fractionation - Study of plant subcellular structures - Observation of chromosomes and mitosis - Staining and observation of blood cells - Fundamentals of electron microscopy

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A1 B1	25	62.5	87.5
Directed discussion	A1 B1 B4 B6 B9 B10 B11 B13	4	8	12
Laboratory practice	A1 A4 A5 A11 A26 A30 A31 B8 B13	15	15	30
Mixed objective/subjective test	A1	2	2	4
Seminar	A1 B4 B9 B11	4	4	8
Workbook	A1 B9	0	3	3
Introductory activities	A1	1	0	1
Online discussion	A1 B4 B9	0	1	1
Personalized attention		1	0	1
(*)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	50 minutes sessions about some of the contents of the program. For better exploitation, it is highly recommended that students have previously read on their own the fundamental aspects of these topics in the recommended texts and completed the questionnaires concerning the topic. This section includes the acquisition of A1 skill.
Directed discussion	This methodology will be developed in the sessions called "Review and Problems". In small groups of 10-15 students, (1) theoretical and practical questions contained in a questionnaire solved by the students prior to the session will be discussed; (2) cases or current issues in cell biology and their implications could also be solved. Finally, the level of understanding of the topics covered will be evaluated individually with a short test or gamified activity. This activity exercises the skills B1, B4, B6, B11 and C1.
Laboratory practice	Some theoretical aspects related to the equipment and experimental methodologies and simple cytological techniques are acquired in the lab. Students should elaborate a memory including: the goal of each practical, protocols followed, results, drawings and interpretations of the observations in detail. Attendance at practicals is mandatory for evaluation. Circumstances that prevent attendance, must be notified/justified to the teachers in charge. In this section skills A4, A30, A31 are developed.
Mixed objective/subjective test	This category includes both a partial liberatory exam and the final exam on the contents of the program worked in the theoretical and practical sessions of the subject
Seminar	In small groups of 10-15 students, it will be worked on a scheduled topic. Previously students should prepare a summary (1-2 pages) or glossary of terms on the topic and a copy will be handed at the end of the session. The session consists of sharing the information and discussing on the topic. With this activity, skills B1,B4, B6, B8 and B11 will be exercised.
Workbook	Two selected texts related to the introduction of the subject will be available to students at the begining of the course to perform a comprehensive reading.

Introductory activities	One session will be dedicated to presentation of the course, explaining its structure, activities, assessment criteria, etc ... also content in the teaching guide. Student can resolve any queries related.
Online discussion	A particular cell biology issue will be proposed in the on-line forum. Contribution and discussion will be expected from the students. In this section, skills B1, B4, B8, B11 will be exercised.

Personalized attention	
Methodologies	**Description**
Seminar Directed discussion Laboratory practice	Students are free to discuss any concerns raised from lectures, but also extensively in seminars and guided discussions. They also have the chance to solve any questions in personalized tutoring sessions.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Mixed objective/subjective test	A1	On the official date, a final exam will be held about the contents of the program worked on in the theory and practical sessions. At mid-term, there will also be a voluntary and liberating partial examination of the theoretical and practical contents worked until then.	60
Directed discussion	A1 B1 B4 B6 B9 B10 B11 B13	Either in the face-to-face session called "Review and Problems", or as homework, the level of understanding of the topics covered in the session will be individually assessed with a short test, analytical question or resolution of a related theoretical case.	20
Laboratory practice	A1 A4 A5 A11 A26 A30 A31 B8 B13	At the end of the laboratory period, it will be required to submit a report about the lab work carried out and the answer of some questions. For evaluation, some of the lab practicals and a few selected questions of the questionnaire associated will be chosen.	20

Assessment comments

Attendance at practical sessions is necessary for being allowed to evaluate the exam.
The final exam of the first call (at the end of the 1st semester) will represent 60% of the final grade. The remaining 40% will be the practicals report and the results of the evaluable activities of the discussion sessions (20% and 20%, respectively). To apply the indicated percentages the student must obtain in the examination a mark superior to 4 out of 10). Anyone who has participated in the Practicals and 3 or more evaluable activities can not opt for the "No presentado". Additionally, realizing that during the course students begin exercising certain skills (in some cases by themselves), active participation in seminars and guided discussions will be positively valued. In particular, the contributions to the seminar and the forum could be taken in consideration for the final grade.
Exceptionally, under justified reasons, students that could not take all the continuous assessment tests (part-time students, specific circumstances of learning or unexpected circumstances), appropiate alternative measures or activities will be taken not to affect the student evaluationIn the second call (July), as long as the practices have been carried out, only the result of the final exam will be taken into account for the final grade.

Fraudulent
performance of the tests or evaulation activities, once verified, will directly
imply a failure grade "0" in the corresponding
opportunity

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Sources of information	
Basic	- Alberts, B. y col. (2011). Introducción a la Biología celular. Panamericana - Cooper, GM. (2010). La célula. Marbán - Karp, G. (2009). Biología Celular y Molecular. McGraw-Hill. Interamericana - Paniagua, R.; Nistal, M.; Sesma, P.; Álvarez-Uría, M.; Anadón, R.; Fraile, B.; Sáez, FJ. (2007). Citología e Histología Vegetal y Animal: Biología celular. Interamericana-McGraw-Hill
Complementary	- Lodish, H.; Berk, A.; Zypursky, S.; Matsudaira, P.; Baltimore, D.; Darnell, J. (2005). Biología Celular y Molecular. Panamericana - Platner, H.; Hentschel, J. (2011). Biología Celular. Panamericana - Alberts, B.; Johnson A.; Lewis, J.; Raff, M.; Roberts, R. & Walter, P (2004). Biología Molecular de la célula. Omega - Pollard, T.D; Earnshaw WC. (2002, 2008). Cell Biology. Saunders

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments
Adaptation to University, with a new system of studying, can be a big effort for all students. Learning outcomes of the subject includes fundamental concepts, familiarity with laboratory work, elaborating practical lab notebooks (presented as a report), finding and processing information from different reliable sources, present and communicate cell biology information clearly. The term finishes very quickly, which means students need to adapt fast to the new system. If students do not adapt quickly enough to work and study independently, this could lead to failure to pass the subject. It is therefore very important that students work on the subject as the course progresses, not leaving it do the last minute before the exam. It is recommended as well to read or work on the topics before lectures and take appropriate notes during lessons, as well as to complete the questionnaires within the two days immediately after the class.