

**1. General information****Course:** BIOLOGY**Type:** BASIC**Degree:** 383 - UNDERGRADUATE DEGREE PROGRAMME IN FOOD SCIENCE AND TECHNOLOGY**Center:** 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY**Year:** 1**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 58302**ECTS credits:** 9**Academic year:** 2022-23**Group(s):** 22 24**Duration:** AN**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** DAVID AGUSTIN LEON NAVARRO - Group(s): 22

Building/Office	Department	Phone number	Email	Office hours
Facultad de Ciencias y Tecnologías Químicas. Lab Bioquímica. Ciudad Real	QUÍMICA INORG., ORG., Y BIOQ.	926052114	davidagustin.leon@uclm.es	First semester: Monday from 4:00 p.m. to 7:00 p.m.; Wednesday from 13 to 2pm; Friday from 11 a.m. to 12 p.m.; Friday from 1pm to 2pm; Second Semester: Thursday from 12:00 to 14:00; Friday from 9 a.m. to 1 p.m.

**Lecturer:** MARGARITA VILLAR RAYO - Group(s): 22

Building/Office	Department	Phone number	Email	Office hours
Facultad de Ciencias y Tecnologías Químicas/ 3ª planta	QUÍMICA INORG., ORG., Y BIOQ.	926052530	MargaritaM.Villar@uclm.es	Mon, M and X from 10 a.m. to 12 p.m. It will be agreed after consultation by email.

**2. Pre-Requisites**

It is recommended a general knowledge in Chemical and Biological Sciences

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

Not established

**4. Degree competences achieved in this course****Course competences**

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
E02	To acquire basic knowledge in biology, biochemistry, physiology and microbiology to allow the study of the nature of foods, causes of their alteration and fundamentals of their production, as well as their role in human nutrition and dietetics
G01	To develop the aptitude to gather and interpret information and data to issue critical judgments that include a reflection on relevant topics of social, scientific or ethical nature.
G02	To possess a correct oral and written communication. To transmit information, ideas, problems and solutions to a both specialized and not specialized public.
G08	To know the principles and the theories of Basic Science as well as the methodologies and applications of the chemistry, physics, biology and mathematics that are necessary to acquire the specific knowledge of the Degree.
G09	To develop the motivation for quality, the capacity to adapt to new situations and the creativity.

**5. Objectives or Learning Outcomes****Course learning outcomes****Description**

Know how to identify the stages of the eukaryotic cell cycle, the checkpoints and the consequences of escaping these controls.

Know the fundamentals of cellular metabolism.

Being able to establish a hierarchy of biological organization.

Being able to carry out basic work with simple biological systems in the laboratory, and interpret experimental results.

Being able to collect bibliographic data, present it orally and discuss it.

Know how to describe the structure and functions of cellular organelles and the cytoskeleton.

Being able to compare the general characteristics of prokaryotic and eukaryotic cells, both plant and animal.

Know the basic relationships that living things detail among themselves and with the physical environment.

Know the theories about a common origin of living beings and understand biological diversity as a result of the evolution of populations of organisms.

Know the basic aspects of multicellular organisms with interest for Food Science and Technology.

**6. Units / Contents****Unit 1: Introduction to Biology. Characteristics of living beings. Levels of biological organization. Evolution overview. Theory of evolution through natural**

selection. Evidence of the evolutionary process. Synthetic theory of evolution. The evolutionary tree of life. Taxonomic classification of living beings.

Unit 2: The cell: functional unit of life. Chemical components of the cell. Cell types: prokaryotic and eukaryotic. General structure of a prokaryotic cell. Bacteria of interest in the food industry.

Unit 3: The plasma membrane. Cell membranes: function and properties. Components of the plasma membrane. Transport through the membrane.

Unit 4: Extracellular matrix. Components and functions. Cell wall: functions, components and types

Unit 5: Cytoskeleton. Structure and functions of microtubules, microfilaments and intermediate filaments. Muscle contraction.

Unit 6: Endomembrane system. Structure and function of the endoplasmic reticulum, Golgi complex, lysosomes and vacuoles. Introduction to cellular metabolism. Mitochondrion and chloroplast. Structure and function: cellular respiration and photosynthesis.

Unit 7: Introduction to cellular metabolism. Mitochondrion and chloroplast. Structure and function: cellular respiration and photosynthesis.

Unit 8: Cell nucleus. Nuclear envelope: transport of proteins and RNA. Chromatin organization. Nucleolus

Unit 9: Cell reproduction. Phases of the cell cycle. Cell cycle control. Start control point: Cdk-G1 / S. DNA replication: Cdk-S. G2 / M checkpoint: Cdk-M. Transition from metaphase to anaphase.

Unit 10: Sexual reproduction. Meiosis. Mendel's Laws

Unit 11: Fungi kingdom. Characteristics. Classification. Mushrooms of interest in Food Science and Technology.

Unit 12: Algae. Characteristics. Classification. Algae as food. Products of interest to the food industry.

Unit 13: Vegetal kingdom. Characteristics. Classification. Life cycle of gymnosperms and angiosperms.

Unit 14: Plant structure. Histological structure of a vascular plant. Introduction to the organs of a vascular plant. Introduction to the growth and development of vegetables.

Unit 15: Structures related to sexual reproduction in angiosperms: flowers, seeds and fruits.

Unit 16: Water absorption and movement in the plant. Concept of water potential. Transport through the xylem: transpiration-cohesion-tension mechanism. Transport by the phloem. Solutes transported. Mechanism of translocation: pressure-flow hypothesis.

Unit 17: Vegetable hormones. Definition. Main types: auxins, cytokinins, ethylene, abscisic acid, and gibberellins. Effects on the plant.

Unit 18: Animal Kingdom. General characteristics. Phylum Mollusks: gastropods, bivalves and cephalopods. Form and function. Members of interest in Food Science and Technology

Unit 19: Animal Kingdom. Phylum Arthropods. Subphylum crustaceans. Form and function. Members of interest in Food Science and Technology.

Unit 20: Animal Kingdom. Chordate phylum: fish, birds and mammals. Form and function. Members of interest in Food Science and Technology.

Unit 21: Ecology. Properties of populations. Life strategies. The population and the environment. Interactions between populations.

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB01 E02 G08	1.7	42.5	Y	N	They last 50 minutes. The most relevant information on the agenda is presented. Mobile phones can also be used as audience response systems to encourage student participation.
Workshops or seminars [ON-SITE]	Combination of methods	CB01 E02	0.9	22.5	Y	N	Different types of activities among which find job readings, activities based on just-in-time learning, search of information, visualization of microscopy micrographs electronics and presentation small reports or comments. These activities use a combination of methods between found self-learning, reading scientific articles individual presentation of comments.
Progress test [ON-SITE]	Assessment tests	CB01 E02 G08	0.12	3	Y	N	The student will take three tests progress. The first test of progress will include the contents studied in topics 1-7 and will have place during the first quarter. The second progress test will take place in the second semester and will include topics 1 - 14. The Ultimate Progress Test will take place in the second semester and will cover topics 1 - 21. The tests will consist of a questionnaire with multiple choice questions. The dates of the tests are available at Virtual campus.
Progress test [ON-SITE]	Assessment tests	CB01 E02 G01 G08	0.04	1	Y	N	After finishing the practical sessions, there will be a written exam about laboratory practice. The exam will take place in the classroom of class attendance (theory). The date will be published well in advance on the Virtual Campus
							Test that coincides in time with the final exam. For students who have taken the subject following the continuous assessment model, this test has an estimated duration of 1 hour. It is an integrative test that includes short questions about all

Final test [ON-SITE]	Assessment tests	CB01 E02 G08	0.04	1	Y	N	the theoretical contents of the subject. For students who have decided to take the course following the non-continuous model, this activity allows them to examine the practical and theoretical contents shown during the course as well as the seminars. The duration of the final test for non-continuous students is 4.5 hours and includes multiple choice questionnaires, questionnaires with short questions and questionnaires with problems.
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	CB01 E02 G08 G09	0.6	15	Y	Y	The student will do simple tasks in the laboratory related, between other aspects, with the observation of microscope slides, study of the permeability of the membrane, photosynthesis or analysis of the effect of hormones vegetables on the process of germination. The practices of laboratory are mandatory and not recoverable. If the practices cannot be approved grade.
Group tutoring sessions [ON-SITE]	Group tutoring sessions	E02	0.2	5	N	-	Throughout the course there will be 5 group tutorials that will take place a few days before the four planned progress tests. The date will be announced in advance through the Virtual Campus. The objective of this activity is to clarify doubts. If the doubts were clarified in less than 1 hour, the rest of the class will be used in class attendance (theory).
Writing of reports or projects [OFF-SITE]	Self-study	E02 G01 G02	1.8	45	Y	N	Preparation of the activities programmed in the seminars.
Study and Exam Preparation [OFF-SITE]	Self-study		3.6	90	N	-	Preparation of progress tests (practical and theoretical).
Total:			9	225			
Total credits of in-class work: 3.6			Total class time hours: 90				
Total credits of out of class work: 5.4			Total hours of out of class work: 135				

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
Final test	0.00%	100.00%	Test in which the student can examine the content shown during the theoretical and practical sessions and in the seminars. It consists of several questionnaires with short questions, multiple choice and problems.
Progress Tests	6.00%	0.00%	Multiple choice test on the theoretical contents corresponding to topics 1-7.
Progress Tests	12.00%	0.00%	Multiple choice test on the theoretical contents corresponding to topics 8-14.
Progress Tests	21.00%	0.00%	Multiple choice test on the theoretical contents corresponding to topics 15-21
Progress Tests	20.00%	0.00%	Test corresponding to the practical sessions.
Assessment of problem solving and/or case studies	20.00%	0.00%	This assessment corresponds to the activities carried out during the seminars.
Final test	21.00%	0.00%	Integrative final test consisting of short questions about all the theoretical content of the subject
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

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:

In order to pass the course it is necessary:

a) Have carried out the laboratory practices.

b) The sum of the grades corresponding to the different activities carried out (seminars, theoretical progress tests, practical progress test and final test) weighted according to what is shown in the evaluation system must be equal to or greater than 5.

##### Non-continuous evaluation:

In order to pass the course it is necessary:

a) Have carried out the laboratory practices.

b) Obtain a final grade equal to or greater than 5 after adding the contribution of the final test (95%) and the theoretical work (5%).

Students interested in carrying out the theoretical work should contact the teacher (at least 3 weeks in advance) to select the title of the work and establish a delivery and presentation schedule.

#### Specifications for the resit/retake exam:

Test that covers ALL the theoretical contents studied during the course. It has a value of 60%.

The qualifications obtained in the seminars (20%), theoretical work (5%) and practical exam (15%) during the course are maintained in this call as long as they have been passed during the course.

In this call, students can re-examine the seminars (20%) and the practical exam (15%) if they did not pass these activities previously. In this case, the test has a value of 80% (if the exam also includes the content covered in the seminars) or 95% (if the exam also includes the content covered in the seminars and the practical exam).

Students interested in carrying out the theoretical work should contact the teacher (at least 3 weeks in advance) to select the title of the work and establish a delivery and presentation schedule.

To pass the course, students must meet all the requirements indicated below:

a) have completed the practices.

b) The sum of the grades considered for the calculation of the final grade (seminars, theoretical work, practical exam and extraordinary call) weighted as shown at the beginning of this block must be equal to or greater than 5.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Alberts, Johnson, Lewis, Raff, Roberts, Walter	Biología molecular de la célula. 5ª Edition.	Omega			2008	Libro dedicado fundamentalmente a estudiantes de Biología, con un orden muy preciso y completo. Recomendado para los temas 1-10 de la asignatura. El alumno puede utilizarlo como libro de texto y para cualquier consulta de biología celular.
Bruce Alberts, Dennis Bray, Karel Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter	Introducción a la Biología Celular. Tercera edición.	Medica panamericana			2011	Libro muy recomendable para la asignatura. Posee un texto claro y sencillo y unas ilustraciones que ayudan a entender los principales procesos celulares.
Campbell, Neil A. (1946-)	Biología / Neil A. Campbell, Jane B. Reece ; colaboradores y	Editorial Médica Panamericana		978-84-7903-998-1	2007	Libro de consulta de Biología general recomendable para los temas 11-21.
Curtis H., Barnes N.S., Schnek A., Massarini	Biología. 7ª ed	Editorial Médica Panamericana			2008	Texto sencillo y adecuado para una primera aproximación a la Biología.
Gerald K.	Biología Celular y Molecular. Conceptos y experimentos	McGraw Hill-Interamericana.			2009	
Raven, P., Johnson, G., Losos, J., Mason, K., and Singer, S.	Biology 8th Edition.	MacGraw-Hill Ed.			2008	Libro de consulta de Biología general recomendable para los temas 11-21. Hay ediciones anteriores traducidas al español. Es un libro amplio, que describe una panorámica completa de la biología. Al final de cada capítulo se presentan resúmenes y muy buenas referencias bibliográficas.
Sadava, D., Heller, C., Orians, G.H., Purves, W.K., Hillis, D.	Life. The Science of Biology. 8th edition	Sinauer Associates and W. H. Freeman			2008	
Solomon E.P., Berg L.R., Martin D.W	Biología 8ª ed	McGrawHill			2008	Texto sencillo y adecuado para una primera aproximación a la Biología. Incluye objetivos de aprendizaje y cuestiones de repaso en

