



IDENTIFYING DATA

Biology: Biology I

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|-------------------|---|-----------------|------|------------|
| Subject | Biology: Biology I | | | |
| Code | V10G061V01101 | | | |
| Study programme | (*)Grao en Ciencias do Mar | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 6 | Basic education | 1st | 1st |
| Teaching language | #EnglishFriendly Spanish | | | |
| Department | | | | |
| Coordinator | Pasantes Ludeña, Juan José Miguel Villegas, Encarnación de | | | |
| Lecturers | Miguel Villegas, Encarnación de Pasantes Ludeña, Juan José | | | |
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Web

General description Biology I is one of the mandatory subjects in the first semester of the first year of the Degree in Marine Sciences. The basic biological principles of cell biology and genetics are studied, mainly:

- 1) cell and tissue organisation.
- 2) development and cell differentiation.
- 3) transmission and characterization of hereditary material.
- 4) basic aspects of evolution and the origin of species.

Theoretical and practical lessons are employed in the teaching program in order the students be familiar with

- 1) basic histological methods and microscopic identification
- 2) the solving of practical problems in genetics and cell biology.

English Friendly subject: International students may request from the teachers: a) materials and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.

Competencies

Code

- | | |
|-----|---|
| B1 | Know and use vocabulary, concepts, principles and theories related to oceanography and apply everything learned in a professional and/or research environment. |
| B2 | Plan and execute surveys in the field and laboratory work, applying basic tools and techniques for sampling, data acquisition and analysis in the water column, sea bottom and marine substratum. |
| B3 | Recognize and implement good practices in measurement and experimentation, and work responsibly and safely both in field surveys and in the laboratory. |
| B4 | Manage, process and interpret the data and information obtained both in the field and in the laboratory. |
| B5 | Develop, implement and write basic or applied projects in oceanography from a multidisciplinary perspective. |
| C9 | Acquire basic knowledge about the structural and functional organization and the evolution of marine organisms. |
| C11 | Apply the knowledge and techniques acquired to the characterization and sustainable use of living resources and marine ecosystems. |
| D1 | Develop the search, analysis and synthesis of information skills oriented to the identification and resolution of problems. |
| D2 | Acquire the ability to learn autonomously, continuously and collaboratively, organizing and planning tasks over time. |

Learning outcomes

| | |
|------------------------------------|-------------------------------|
| Expected results from this subject | Training and Learning Results |
|------------------------------------|-------------------------------|

| | | | |
|--|----|-----|----|
| 1. Define, look for, organize and elaborate works with information of the subject | B1 | C9 | D1 |
| 2. Cooperatively workout exercise resolution | B2 | C11 | D2 |
| 3. Use of telematic tools and other sources for autonomous learning | B3 | | |
| CELL BIOLOGY | B4 | | |
| 4. Recognize the diversity and organisation of cells and tissues | B5 | | |
| 5. Establish relations between cell compartments and cell functions | | | |
| 6. Differentiate clearly vegetal and animal cell organisation | | | |
| 7. Establish relationships between cell organisation and cell function | | | |
| 8. Optical microscope utilization | | | |
| 9. Knowing staining techniques | | | |
| 10. Identification of cell organelles by electron microscopy and tissues by optical microscopy | | | |
| GENETICS | | | |
| 11. Importance of DNA in biology | | | |
| 12. Apply the scientific method and basic research technologies in Genetics | | | |
| 13. Learn how to establish genetic hypotheses and strategies to refute them | | | |
| 14. Manage the basic mechanisms for the transmission of the hereditary material | | | |
| 15. Know the molecular structure, the regulation and the expression of the hereditary material | | | |
| 16. Know the basic genomic principles and their biotechnological applications. | | | |
| 17. Know the origin of the biological diversity and the evolutionary history of the species | | | |

Contents

Topic

| | |
|---|---|
| Cell biology, 1st part. General organisation of the eukaryotic cell | Cell evolution. Endosymbiosis: Evolutionary importance. Similarities and differences of animal and plant cells. Cell membranes: composition. Functional properties. Plasma membrane and cell surface. Cell junctions and cell adhesion. Cell communication. Cytoplasm and cell organelles (I): Endoplasmic reticulum, Golgi and lysosomes. Vesicular traffic (II): peroxysomes, mitochondria and chloroplasts. Cytoskeleton and cell movement. The nucleus: chromatin and chromosomes. The nucleolus. |
| Cell biology, 2nd part. Bases of embryonic development | Cell cycle: interphase and M phase. Apoptosis. Gametogenesis. Fertilization and development of the zygote. Cell specialization. |
| Cell biology, 3rd part. Tissues | Animal tissues. Epithelium: General organisation and function. Conjunctive tissue and derivatives. General organisation. Specialized conjunctive tissues : general characteristics of cartilage, bone and blood. Muscular tissue. Nervous tissue. The plant cell. |
| Genetics | DNA structure, organisation, replication, alterations and expression. Mendelian heredity and its variations. Linkage and recombination. DNA technologies and their applications |

Planning

| | Class hours | Hours outside the classroom | Total hours |
|---------------------------------|-------------|-----------------------------|-------------|
| Lecturing | 39 | 39 | 78 |
| Problem solving | 6.5 | 6.5 | 13 |
| Practices through ICT | 6 | 6 | 12 |
| Objective questions exam | 2 | 14.5 | 16.5 |
| Problem and/or exercise solving | 0.5 | 30 | 30.5 |

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

| | Description |
|-----------------------|--|
| Lecturing | Description, by the teaching staff, of the contents of the study subject, of the theoretical bases and/or the guidelines of the work, the exercise or the project to be developed by the students. |
| Problem solving | Resolution of genetic exercises |
| Practices through ICT | Application of the learned contents to specific situations and acquisition of basic skills and procedures related with the object of study in spaces with specialized equipment (laboratories, computing rooms, etc.). |

Personalized assistance

| Methodologies | Description |
|-----------------------|--|
| Practices through ICT | The teaching staff will continuously assess the participation of the students along the course |
| Lecturing | The teaching staff will continuously assess the participation of the students along the master sessions and their on-line activities |

| | |
|---------------------------------|--|
| Problem solving | The teaching staff will continuous assess the participation of the students in exercise solving and in the quality of solved exercises |
| Tests | Description |
| Problem and/or exercise solving | he teaching staff will continuous assess the quality of the solved problems, questions and exercices for each student along the semester |

| Assessment | | | |
|---------------------------------|---|---------------|---|
| | Description | Qualification | Training and Learning Results |
| Lecturing | Final exam: the assesment of the subject Biology I will be performed by means of a written exam. In this exam the theoretical and practical contents will be evaluated by means of test of multiple answers, questions with specific short or long answers, identification and interpretation of figures / images as well as the resolution of genetic problems Final exam. Cellr biology 24 % Genetics 29 % | 53 | B1 C9 D1 B2 C11 D2 B3 B4 B5 |
| Objective questions exam | Final exam | 2 | B1 C9 D1 B2 C11 D2 B3 B4 B5 |
| Problem and/or exercise solving | Evaluation will be the result of: 1: The assesment of the quality of the resolution of the Genetic problems and exercises proposed along the course (20 %) 2: The marks obtained in Cell biology questionaries, exercises and identification of structures (25 %) | 45 | B1 C9 D1 B2 C11 D2 B3 B4 B5 |

Other comments on the Evaluation

The final qualification includes:

a) The mark obtained in solving problems, exercise and questionaries along the course (45 %: Cell Biology 25 %, Genetics 20 %). This mark will be kept for the second oportunity

b) The mark obtained in the first or second oportunity exam (55 %: Cell Biology 25 %, Genetics 30 %).

To pass the subject, a minimum of 2 points in each of the two blocks that compose the subject (Genetics and Cell Biology), and a minimum of 5 points in total, are required. It is also necessary to reach a minimum of 4 points from a total of 10 in the Genetics exam. If those minimums are not reached, the maximum numerical qualification to be reflected in the "acta" will be 4.5.

In case that the final calification do not reach the pass minimum (5 points), but are equal or higher than 2.5 in one of the two blocks (Genetics or Cell Biology), the mark will be kept for the "second edition" (July) if the student is explicitly in accordance with it.

Date, time and place of exams will be published in the official web of Marien Scienes Faculty:

<http://mar.uvigo.es/index.php/en/alumnado-actual-2/examenes-3>

The students from previous courses will have to take part in all the programmed activities again.

Students are strongly requested to fulfil a honest and responsible behaviour. It is considered completely unacceptable any alteration or fraud (i.e., copy or plagiarism) contributing to modify the level of knowledge and abilities acquired in exams, evaluations, reports or any kind of teacher's proposed work. Fraudulent behaviour may cause failing the course for a whole academic year. An internal dossier of these activities will be built and, when reoffending, the university rectorate will be asked to open a disciplinary record

Sources of information

Basic Bibliography

Campbell N. A. & Reece J. B., **1. BIOLOGÍA**, 7ª ed, Panamericana, 2007

Pierce BA, **Genética. Un enfoque conceptual**, 978-1319050962, 5ª ed, Panamericana, 2015

Complementary Bibliography

Sadava / Heller / Orians / Purves / Hillis, **VIDA La Ciencia de la Biología**, 8ª ed, Panamericana, 2009

Brown TA, **Genomes 4**, 978-8498353921, 4ª ed, Garland Science, 2017

Recommendations

Subjects that continue the syllabus

Marine genetic resources/V10G060V01907

Other comments

The study of the subject in a continuous way will allow the students to take part in active form in the course syllabus. It is recommended to show a real interest in the course, showing a good attitude and demonstrating aptitude in the acquisition of knowledges. The knowing, comprehending, thinking and reasoning the basic notions of the subject will be indispensable to take part in the distinct activities proposed by the teaching staff and be evaluated positively.

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===

Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching methodologies maintained

* Teaching methodologies modified

None. All methodologies will be carried out telematically by means of the utilities accessible through the Remote Campus of the University of Vigo.

* Non-attendance mechanisms for student attention (tutoring)

Institutional e-mail

Applications available from Remote Campus of the University of Vigo

* Modifications (if applicable) of the contents

Not applicable

* Additional bibliography to facilitate self-learning

<https://www.ncbi.nlm.nih.gov/books?term=The+Cell%3A+a+molecular+approach+AND+cooper%5Bbook%5D>

<https://www.ncbi.nlm.nih.gov/books/NBK21054/?term=alberts%20molecular%20biology%20of%20the%20cell>

<https://www.ncbi.nlm.nih.gov/books/NBK9983/>

<https://www.lab.anhb.uwa.edu.au/mb140/>

<https://www.ncbi.nlm.nih.gov/books/NBK21766/?term=genetics>

* Other modifications

=== ADAPTATION OF THE TESTS ===

* Tests already carried out

No change

* Pending tests that are maintained

All

* Tests that are modified

None

* New tests

None

* Additional Information

Students will be visually monitored in telematic exams through Remote Campus. If there is any technical or personal problem, recorded oral exams will be performed. Exam revision sessions will also be recorded.
