



IDENTIFYING DATA

Biology: Biology

Subject	Biology: Biology			
Code	V11G200V01101			
Study programme	(*)Grao en Quimica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	1st
Teaching language	Spanish			
Department	Biochemistry, Genetics and Immunology			
Coordinator	Arenas Busto, Miguel			
Lecturers	Arenas Busto, Miguel			
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General description	The matter of Biology has like aim the preparation of the studens to comprise and explain better the living beings, as they are constituted and as they work, as they study , as they contrast the hypotheses and the experimental facts to elaborate the biological theories.			

Competencies

Code	
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
C15	Demonstrate knowledge and understanding of essential facts, concepts, principles and theories in: chemistry of biological molecules and their processes
D1	Communicate orally and in writing in at least one of the official languages of the University
D3	Learn independently
D4	Search and manage information from different sources
D7	Apply theoretical knowledge in practice
D8	Teamwork
D9	Work independently
D12	Plan and manage time properly
D13	Make decisions
D14	Analyze and synthesize information and draw conclusions
D15	Evaluate critically and constructively the environment and oneself

Learning outcomes

Expected results from this subject	Training and Learning Results		
	A5	C15	D1 D3 D4 D7 D9 D12 D14
Understand the cell like fundamental unit of the be alive.			
New			
New			
Understand the properties and organisation of the distinct *cellular organelles.	A5	C15	D1 D3 D4 D7 D9 D12 D14

Know the cellular structure in **procariotas and *eukaryotic .	A5	C15	D1 D3 D4 D7 D9 D12 D14
Relate the cellular structures with the metabolism.	A5	C15	D1 D3 D4 D7 D9 D12 D14
Understand the distinct metabolic *roads of the distinct organic molecules.	A5	C15	D1 D3 D4 D7 D9 D12 D14
Describe the hereditary material and know the principles of the central dogma.	A5	C15	D1 D3 D4 D7 D8 D12 D13 D14 D15
Define the process of mutation and his implication in the evolutionary processes.	A5	C15	D1 D3 D4 D7 D9 D12 D14
Know the technicians of DNA **recombinante .	A5	C15	D1 D3 D4 D7 D8 D9 D12 D13 D14 D15
Comprise the importance of the immune *system .	A5	C15	D1 D3 D4 D7 D8 D12 D13 D14 D15

Contents

Topic	
1. The cell.	Size, form and cellular function. Cell classification. Cell Theory. Procaryotic cell and eukaryotic cell.
2. Biomembranes and systems of cellular transport.	Cell membrane: functions, biochemical composition, physic-chemical properties. Synthesis of the cellular membrane. System of transport through the biological membranes: bombs, protein transporters and channels.

3. The core and the chromosomes. The cellular organelles.	Cell nucleus: structure, composition and functions. Structure and functions of the nucleolus. Structures and functions of chromatin and chromosomes. Structure, composition and functions of: matrix extracellular, cytoskeleton and centrioles, endoplasmatic reticulum, apparatus of Golgi, endosomes and lisosomes, mitochondria, peroxisomes and cloroplasts.
4. Cellular division and cellular cycle.	Definition and characteristics of mitosis. Differences between somatics and germinal cells. Phases of the cellular cycle. Biological meaning of mitosis. Concept of the apoptosis, cellular proliferation and cancer. Concept and differences between asexual and sexual reproduction. Definition and characteristic of meiosis. Phases of meiosis. Origin of the genetic variability of the meiosis. Differences between mitosis and meiosis.
5. General design of the metabolism: catabolism and anabolism.	Concept of: enzyme, energetic metabolism, metabolic route, catabolism, anabolism. The equivalent of ATP. Extraction of the chemical energy of the organic compounds: glucides, lipids and proteins.
6. Photosynthesis.	Nature of the light. Photosynthetic pigments. Stages of the photosynthesis: luminous phase and dark phase (cycle of Calvin). The problem of the photorespiration: plants C4 and plants CAM.
7. DNA, structure and function.	Composition, structure of the DNA. Function of the DNA. Replication of the DNA. Initiation the technicians of the recombinant DNA.
8. RNA and the expression of the genetic message.	Composition and structure of the RNA. mRNA, tRNA and rRNA. Other types cellular RNAs and its functions. Review of the concepts of transcription and translation. Language of the genic information.
9. Mutation and evolution.	Genic mutations: concept and types. Molecular consequences of the genic mutations. Structural chromosomal mutations. Numerical chromosomal mutations. Origin and consequences of the mutations. Relation of the mutations and cancer. Evolutionary theories. Arguments in favour of wool evolution.
10. The immune system.	Concept of immune system. Components of the immune system. Mechanism of the innate defence of the immune system. Antibodies and interferon. Types of immune response. Alterations of the immune system. Importance of the vaccines.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	48	74
Seminars	13	26	39
Problem solving	0	17	17
Supervised work	2	13	15
Short answer tests	1	4	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	In these classes the professor will explain and will develop the concepts and basic aspects of the subject in clear form to facilitate their understanding. The contents of each subject will be exposed in the platform TEMA with sufficient time so that the students can consult them. It is recommended that the student work on this material, consulting besides the bibliography recommended.
Seminars	These classes will be oriented to: a) Explanation of all type of doubts of the previously explained concepts. b) The students will perform pictures and schemes of the subjects analysed in the theoretical classes with the aim to adquire an overview of the subject, what will facilitate its understanding. c) In this section students will work on some contents of Biology, that by experience of the teacher are of a more difficult understanding and that therefore require a greater didactic support. d) When needed, these classes will also be used to perform tutored works and exercises.
Problem solving	Each student will have to perform a series of exercises for each part of the subject to strengthen the study and understanding. These bulletins of exercises will be considered for the evaluation.
Supervised work	To develop the competition *CT8, the students will realise two works in group. The works will be related with the fields of the biotechnology, molecular biology, genetics and immunology and will be proposed by the professor. Part of the information could be provided by the professor.

Personalized attention

Methodologies Description

Supervised work	Presenting and solving questions, exercises and problems related with the subject. Each student will ask the teaching staff the clarifications that estimate opportune to comprise better the subject and develop successfully the tasks. These queries will be attended in schedule of tutorias.
Seminars	Presenting and solving questions, exercises and problems related with the subject. Each student will ask the teaching staff the clarifications that estimate opportune to comprise better the subject and develop successfully the tasks. These queries will be attended in schedule of tutorias.
Problem solving	Presenting and solving questions, exercises and problems related with the subject. Each student will ask the teaching staff the clarifications that estimate opportune to comprise better the subject and develop successfully the tasks. These queries will be attended in schedule of tutorias.

Assessment

	Description	Qualification	Training and Learning Results
Problem solving	The resolution by the students of a series of problems and / or exercises as academic follow-up of the student will be assessed. The final grade of these exercises will be 20% of the final grade.	20	A5 C15 D1 D3 D7 D9 D12 D13 D14 D15
Supervised work	The structuring and organization of the contents, the complexity of the work, the oral presentation and the sources consulted will be evaluated. These works will be exposed in the seminar sessions to the rest of the classmates. The final grade of these works will be 10% of the final grade.	10	A5 C15 D1 D3 D4 D7 D8 D9 D12 D13 D14 D15
Short answer tests	There will be a mid-course (20%) test and another test at the end of the course (final with the whole subject, 50%) on the subject explained in the lectures and seminars. It will consist mainly of short answer questions, although it could include some long answer questions. Said tests will represent 70% (20%, 50%) of the final grade.	70	A5 C15 D1 D3 D4 D7 D9 D12 D13 D14 D15

Other comments on the Evaluation

The student who takes the final evaluation test will be considered as presented.

The final grade of the subject will be given by the weighted average of the three sections of the evaluation. In this way, to pass the subject, said weighted average must be equal to or higher than 5.0.

In the second call, the evaluation will be carried out as follows: 1. The score reached by the student during the course in the supervised works and seminars will be conserved (30% of the final grade). None of these sections is recoverable. 2. An analogous test will be carried out at the end of the semester. This test will be equivalent to 70% of the final grade.

Sources of information

Basic Bibliography

John Kimball, <http://biology-pages.info/>,

Bruce Alberts, Dennis Bray, Karel Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Robert, **Introducción a la Biología Celular**, Tercera Edición, 2011,

Peter J Rusell, **iGenetics. A molecular approach**, Third Edition, 2010,

Leonardo Fainboin, Jorge Geffner, **Introducción a la Inmunología Humana**, Sexta Edición, 2011,

James D. Watson, **Biología Molecular del gen**, Séptima edición, 2016,

Christopher Mathews, K. E. van Holde, **Bioquímica**, Segunda edición,

Complementary Bibliography

Helmut Plattner, Joachim Hentschal, **Biología Celular**, Cuarta Edición, 2014,

Recommendations

Subjects that continue the syllabus

Chemistry, physics and biology: Integrated laboratory 1/V11G200V01103

Subjects that are recommended to be taken simultaneously

Physics: Physics I/V11G200V01102

Mathematics: Mathematics 1/V11G200V01104

Chemistry, physics and biology: Integrated laboratory 1/V11G200V01103

Chemistry: Chemistry 1/V11G200V01105

Other comments

It is recommended to have done the matter Biology of the 2º course of Bachillerato, either in the modality of Sciences of the Health as in the one of Sciences (double option).