

Degree	Type	Year
Biology	OB	2

Contact

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

It is recommended to have passed the general course of Genetics.

Objectives and Contextualisation

This course takes place in the second-year of the Genetics degree providing the fundamental molecular knowledge of inheritance. The course is focus to give the current information on Molecular Genetics regarding gene structure and function,

DNA replication, transcription and translation, as well as regulatory mechanisms of the transmission of the genetic information. In addition, practical knowledge of the main techniques for manipulation of the genetic material are provided. Then, this course looks at the molecular basis of inheritance which principles were learned during the first year in the Genetics course.

The educational objectives are as follows:

- 1) Acquisition of the basic concepts in molecular genetics as well as the composition of the nucleic acids and their roles in the molecular processes.
- 2) To obtain the essential knowledge about the processes driving the flow of genetic information, from DNA replication, transcription and translation in the organisms.
- 3) To be familiar with the regulatory processes of gene expression.

Learning Outcomes

1. CM11 (Competence) Design genetics and genomics experiments adapted to the different fields of biology and respecting ethical principles and social needs.
2. KM16 (Knowledge) Describe the structure and organisation of nucleic acids in different groups of organisms.

3. KM17 (Knowledge) Define the mechanisms of heredity and the processes that regulate gene expression, as well as the fundamentals of genetic improvement.
4. KM19 (Knowledge) Identify the specific bibliographic sources in genetics that allow, in an autonomous way, to develop and extend the knowledge acquired.
5. SM13 (Skill) Carry out different kinds of genetic analyses of living beings using genomic techniques and interpreting the results obtained.
6. SM14 (Skill) Carry out molecular genetics and genomics experiments that require the preparation of reagents and the handling of specialised laboratory utensils.

Content

Content

1. Introduction to Molecular Genetics.
2. The nature of genetic material.
3. Structure of the chromosome.
4. Replication of genetic material and replication enzymes.
5. DNA Recombination and repair.
6. Transcription.
7. Types of RNA and processing mechanisms.
8. Genetic code and the translation process.
9. Prokaryotic and eukaryotic gene regulation.
10. Genome organization

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices	12	0.48	CM11, SM14, CM11
Lectures	35	1.4	KM16, KM17, KM16
Problems-seminars sessions	3	0.12	CM11, SM13, CM11
Type: Supervised			
Tutorials	6	0.24	CM11, KM19, SM13, CM11
Type: Autonomous			
Search of bibliography	3	0.12	KM19, KM19
Solving problems	6	0.24	CM11, KM19, SM13, CM11
Study	77	3.08	KM16, KM17, KM19, SM13, KM16

Lectures:

Lectures are based on master classes with ICT support. Emphasis is made to acquisition of important concepts and skills for the students. Also the use of diverse information sources facilitates the understanding of

complex issues. Lectures do not offer much interaction but using diverse ICTs (ex. video projection) encourage discussion and dynamism along the lessons.

Problems-Seminars:

The sessions are performed in small groups which allow to deepen the information given on the master class and to work on specific areas of the course. These sessions promote students to apply the theoretical knowledge to solve practical problems, as well as to demonstrate their skills by solving problems on the blackboard. In addition, students have to debate practical cases, and to make the oral presentation of topics proposed in class.

Tutorials:

Here the student has the possibility to raise specific doubts related to the course. This is an essential teaching complement that allows to provide individual attention to the students.

Practices:

These sessions are done in small groups. Here the student have the opportunity to work at the laboratory doing experiments related to practical cases of the subject. The data obtained in the experiments are analyzed and a global view of the techniques used is given.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assigned homework	5% of the final grade	0	0	CM11, KM16, KM19, SM13
Evaluation of practices	20% of the final grade	2	0.08	CM11, SM13, SM14
Midterm exams	75% of the final grade	6	0.24	CM11, KM16, KM17

The evaluation of the competences is done as follows:

1. The students perform two midterm exams to evaluate the contents of theory and problems. It is necessary to obtain a grade ≥ 5 in each of the midterm exams, to pass the subject. The grade corresponding to this evaluation is the average of the individual grade obtained in the two test. The average grade obtained by this concept represents 75% of the final subject grade. To be eligible for the retake process, the student should have been previously evaluated in a set of activities equaling at least two thirds of the final score of the course. If the student do this exam to improve the grade, only the grade of the last exam will be valid.

2. Evaluation of practices. A test will be made for each module of the practical sessions. The grade of practices is the average grade of modules grade, and represents 20% of the final grade of the course. To pass the course it is necessary to take the questionnaires of practices and obtain an average grade equal to or greater than 5. Questionnaires not completed will have a score of zero. The student will be able to overcome any failed tests through a second-chance exam. Attendance at practical sessions is mandatory. The students will not pass the course when their absence to practical sessions is superior to 20% of the programmed sessions.

3. The evaluation of the assigned homework related to the subject represents 5% of the final grade of the course.

The use of Artificial Intelligence (AI) technologies is prohibited in this course. Any work that includes AI-generated fragments will be considered a violation of academic honesty and may result in a partial or total penalty on the assignment grade, or greater penalties in serious cases.

It is necessary to obtain a grade ≥ 5 in the midterm exams of theory content to do the average grade with the grades obtained in practices and the assigned homework.

The student will be graded as "No Avaluable" if the weighthin of all conducted evaluation activities is less than 67% of the final score.

Single Assessment

The single assessment consists of a single synthesis test in which the contents of the entire theory and exercises program of the subject will be assessed. The test will consist of questions of the same type as the continuous assessment. It is necessary to obtain a grade ≥ 5 in the synthesis test to pass the subject. The grade obtained in this synthesis test will account for 75% of the final grade of the subject.

Attendance at practical sessions is mandatory. The evaluation of this part will follow the same process as the continuous evaluation. The grade obtained in this part represents 20% of the final grade of the subject.

The evaluation of the assigned homework related to the subject will follow the same process as the continuous evaluation and it represents 5% of the final grade of the course.

The single evaluation test will take place at the same time that the last midterm test of the continuous evaluation (date and time set in the academic calendar), and the same recovery system will be applied as for the continuous assessment.

Bibliography

1) Pierce, B.A. 2016. Genética. Un enfoque conceptual. (5th edition). Ed. Médica Panamericana. Online library access (<https://www.uab.cat/biblioteques>)

2) Watson, J.D.; Baker, T.A.; Bell, S. P.; Gann, A.; Levine, M.; Losick, R. 2016. Biología Molecular del Gen. (7th edition). Editorial Médica Panamericana. Online library access (<https://www.uab.cat/biblioteques>)

3) Krebs, J.E.; Goldstein, E. S.; Kilpatrick, S.T. 2017. Lewin's Genes XII (12th edition). Jones and Bartlett Publishers.

4) Brown, T.A. 2007. Genomes. (3rd Edition). Ed. Médica Panamericana.

Web links:

-Campus virtual interactiu <https://cv2008.uab.cat>

Software

No

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	121	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	122	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	121	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	122	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	123	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	124	Catalan	first semester	morning-mixed
(TE) Theory	12	Spanish	first semester	afternoon