

Genetics

Code: 107544
ECTS Credits: 6

2024/2025

Degree	Type	Year
2500502 Microbiology	FB	1

Contact

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Teaching groups languages

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

Prerequisites

There are no prerequisites, but it is recommended to review the concepts of Genetics learned in high school. Likewise, it is convenient to have a good knowledge of the basic materials studied during the first semester of the Microbiology degree, as well as of the subjects taking simultaneously during the second semester.

Objectives and Contextualisation

The science of genetics studies everything that refers to the hereditary material of living beings, how it is transmitted to offspring, how it is expressed and how it varies and evolves in populations. It is a fundamental science that integrates the molecular, population and evolutionary levels of organization of organisms.

The subject of Genetics is intended for first-year students to discover the basic concepts of this science in order to interpret i) the laws of inheritance, ii) their cytological and molecular basis and iii) variation at the cellular and population levels.

The main objectives of this subject are:

- Identify the bases and mechanisms of biological inheritance and construct and interpret genetic maps;
- Determine and compare genetic variation within and between populations;
- Recognize the structure of the genetic material and its organizational variability;
- Develop the ability to reason, interpret and draw conclusions by solving questions, basic genetics problems and/or by discussing scientific texts to the elaboration of assignments.

Learning Outcomes

1. CM05 (Competence) Evaluate the global dynamics of natural systems at different scales of analysis to provide innovative responses to societal demands and care for the environment.
2. CM06 (Competence) Integrate knowledge and skills from the field of biology, working individually and in groups, to prepare and present in writing or orally and publicly a scientific work.

3. KM10 (Knowledge) Identify the structure and organisation of genetic material and the mechanisms of biological inheritance.
4. SM08 (Skill) Interpret the bases of evolution and its relationship with the structure and operation of biological systems at all levels of organization.

Content

The content of this course is the following:

An introduction to Genetics. Organization of the genetic material. Replication and recombination mechanisms. Gene expression: transcription and translation processes. Gene regulation. Point mutation and chromosomal mutation. DNA Repair. Mendelian genetics and chromosomal theory of inheritance. Patterns of gene inheritance. Sex-linkage inheritance. Patterns of two genes inheritance. Relations of dominance. Linkage and genetic maps. Quantitative genetics. Populations Genetics and evolution.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problem sessions	12	0.48	KM10, SM08, KM10
Theory sessions	33	1.32	KM10, SM08, KM10
Type: Supervised			
Tutorials	3	0.12	KM10, SM08, KM10
Type: Autonomous			
Reading texts	8	0.32	CM05, CM06, KM10, SM08, CM05
Searching of bibliography	6	0.24	CM05, CM06, CM05
Solving problems	30	1.2	KM10, SM08, KM10
Study	45	1.8	CM05, CM06, KM10, SM08, CM05
Writing assignments	8	0.32	CM05, CM06, CM05

In this subject the following activities have been programmed:

Lectures:

The student acquires the scientific knowledge of the class by attending to lectures, and are complemented by personal work and study of the topics discussed. These lectures are conceived as a fundamentally unidirectional method of transmitting knowledge, from the teacher to the student, and it forces the student to develop autonomous learning strategies out of the classroom.

Problem sessions: Here the knowledge acquired in the theory classes and by personal study are applied to the resolution of practical cases (questions, interpretation of texts and / or basic problems of genetics), working the

strategies to solve problems. The student will work individually or in small groups which allow him to acquire the ability of analysis and synthesis. In addition, the problem sessions will allow the application of statistical resources in the interpretation of genetic data. Weekly, some practical cases will be assigned as homework to resolve by the students individually or in groups.

Assignment of homework to perform in groups. In this activity the students will apply the knowledge acquired in theory and problem sessions, and the activity encourage bibliography searching and to do teamwork.

Tutorials: The student will have the opportunity to solve doubts related to the class by individual tutoring. This is an essential teaching complement that allows to provide individual attention to the students. The detailed information regarding the place and hours where this activity will take place will be duly provided by the teacher.

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	10% of the final grade	0	0	CM05, CM06
exam 1	45% of the final grade	2.5	0.1	KM10, SM08
exam 2	45% de la nota final	2.5	0.1	KM10, SM08

This subject will be evaluated through continuous evaluation. The result of the different written tests and the delivery of activities will be taken into account.

The evaluation of the contents of the theory and problems classes will be carried out in the following way:

Evaluation tests. There will be two eliminatory partial evaluation tests with multiple-choice questions. Each test will be equivalent to 45% of the final grade and will be passed with a minimum grade of 5. The average of the two tests will be obtained; the student who obtains at least 4 in a text will be able to average it with the grade of the other test. If the average does not reach the passing grade (5), the subject not passed will be re-evaluated in the recovery test.

Delivery of assignments related to the theoretical contents and problems. This module will have an overall weight of 10% of the final grade of the course. It is necessary that the student obtains a minimum of 5 in the set of written tests in order to average the grade obtained in the delivery of assignments. In order to pass the course, it will be necessary to obtain a minimum grade of 5 between the written tests and the delivery of assignments.

Recovery and grade improvement exam. Students who have obtained an average of the two partial tests lower than 5 will have to take the recovery test of the part or parts not passed. To participate in the recovery, the student must have been previously evaluated in a set of activities equivalent to a minimum of two thirds of the total grade of the subject.

Students who having passed the two partial tests wish to obtain a better grade in one or both of them may re-examine the corresponding part of the subject, taking into account that the final grade will be the one obtained in this last test.

Students will obtain the grade of "Not Valuable" when the evaluation activities performed have a weight of less than 67% in the final grade.

Students who cannot attend an individual evaluation test for justified reasons and provide the corresponding official documentation will have the right to take the test in question on another date.

Single evaluation. The single evaluation consists of a single synthesis test that includes the contents of the entire theory program with a weight of 90% of the final grade of the subject. In order to pass this test it is necessary to obtain a minimum grade of 4.9.

The evaluation of the delivery of assignments will follow the same procedure of the conventional evaluation. The student who takes the single evaluation may hand in these assignments on the same day as the day set for the synthesis test.

The single evaluation test will coincide with the data test set in the calendar for the last continuous evaluation test and the same recovery system will be applied as for the continuous evaluation.

Bibliography

Books:

- 1) Benito, C., F.J. Espino. *Genética*. (2013). Conceptos esenciales. Ed. Médica Panamericana. Acceso online Biblioteca (<https://www.uab.cat/biblioteques/>)
- 2) Pierce, B.A. 2016. *Genética. Un enfoque conceptual*. (5th edition). Ed. Médica Panamericana. Online library access (<https://www.uab.cat/biblioteques/>)
- 3) Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C., Carroll, S.B. (2008) "*Genética*". 8a edició. McGraw-Hill / Interamericana de España (<https://www.uab.cat/biblioteques/>)

Problemas:

- 1) Benito, C. 1997. 360 problemas de *Genética*. Resueltos paso a paso. Editorial Síntesis, Madrid.

web:

Aula Virtual de l'Autònoma Interactiva: <https://cv2008.uab.cat>

Software

no

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	711	Spanish	second semester	morning-mixed
(PAUL) Classroom practices	712	Spanish	second semester	morning-mixed
(TE) Theory	71	Spanish	second semester	afternoon

PROVISIONAL