UAB
Universitat Autònoma de Barcelona

Genes and Society

Code: 106225
ECTS Credits: 6

2024/2025

Degree	Type	Year
2504235 Science, Technology and Humanities	OB	3

Contact

Name: Rafael Montiel Duarte

Email: rafael.montiel@uab.cat

Teachers

Carlos Tabernero Holgado

Teaching groups languages

You can view this information at the end of this document.

Prerequisites

It is advisable to review the topic of "Ethics and science" from the subject of Fundamentals of philosophy and ethics (1C-1S); Block 3-Science and technology studies, from the subject of Fundamentals and technology (1C-2S); and Block 1 of the Life and Evolution subject (1C-2S).

Objectives and Contextualisation

The study of genes has progressed from empirical observations on heredity in ancient times to biotechnology and genomics. It began to acquire a scientific framework with Mendel's experiments in the 19th century and has developed exponentially with the latest advances in molecular biology and DNA sequencing technologies. Currently, genetics is a central discipline in biology and medicine, with applications ranging from basic research to gene therapy and biotechnological agriculture, and which therefore has a great social impact.

The objective of this course is to develop a comprehensive understanding of genetics, not only from a scientific perspective, but also considering its ethical, social and cultural implications.

Working on fluid and interconnected themes, the concept of gene will be assimilated, including functional and evolutionary aspects; the gene-environment and gene-culture interaction; the consequences of mutations; manipulation of genes; and the historical and social dimension of genetics.

Competences

- Explain the basic concepts related to life, its origin and evolution, especially those referring to health and illness throughout history.
- Relate terrestrial dynamics and the variable of time in the terrestrial, atmospheric and climatic processes, and identify the problems generated by use of natural resources on the part of humans.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

Learning Outcomes

1. Analyse the mechanisms that generate biological diversity in our species and interpret their adaptive significance and the mechanisms that maintain this diversity.
2. Apply the knowledge acquired in complex or professional work settings.
3. Identify your own training needs in the field of study, work or professional practice, and organise your own learning.
4. Relate the different living beings to each other and to their surroundings.

Content

- Introduction to Genetics

- Historical Perspective of Inheritance

- Genetics and Technology

- Genetics and Health

- Genetics and Biodiversity

- Genetics, Culture and Society

- Social and Ethical Impact

- Case Study and Practical Applications

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classroom Practice	16	0.64	2, 3, 4
In-person lessons	33	1.32	1, 2, 3
Type: Supervised			
Tutorials	5	0.2	3, 4
Type: Autonomous			
Bibliographic recearch	7	0.28	1, 2, 3, 4

Personal study	55	2.2	1, 2, 3, 4
Repor writing	15.5	0.62	1, 2, 3, 4
Scientific text reading	16	0.64	

To achieve the objectives of the course, the teaching methodology focuses on learning, using three types of strategies: 1) sessions with the whole group, 2) individual or small group activities within the classroom or on the Virtual Campus and 3) individual or group autonomous work for the preparation of writings and presentations. The tools provided by the UAB Virtual Campus and other internet resources will be used.

Sessions with the whole group: Classroom sessions complemented by personal study. These sessions will include a) presentations by the teaching staff that will encourage student participation in the form of debates or collective reflections, and b) flipped classroom, in which the students will previously analyse the study material and carry out previous tasks to discuss them later in the sessions in which doubts will be resolved and exercises will be carried out.

Evaluable individual or group classroom activities: Review exercises, reading controls, problem solving, discussion of shared readings and guided debates will be carried out.

Autonomous individual or group work: preparation for the flipped classroom, preparation of writings and preparation of presentations or debates that they will lead in front of the group.

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
Individual and small group activities during the academic year	20	0.5	0.02	1, 2, 3, 4
Mid-term exam and final essay	50	2	0.08	1, 2, 3, 4
Teamwork presentation	30	0	0	1, 2, 3

Assessment:

Continuous assessment

a) A written test and the delivery of an essay: each with a weight of 25% of the final grade (total 50%). To pass the subject it is a requirement that the average of these instruments be a minimum of 5.

b) Activities carried out in the classroom or on the Virtual Campus: 20% of the final grade.

c) Teamwork: 30% of the final grade. This evaluation will consider: the presentation (15%) and the written work (15%). The evaluation will be individual and may consider self-assessment.

To pass the subject it is necessary to obtain at least a 5 in the final grade. At the end of the course, a recovery test will be carried out for students who have failed the written test and have not exceeded the minimum average between the test and the essay. To participate in the recovery, students must have been previously

evaluated in a set of activities whose weight is equivalent to a minimum of two thirds of the total grade for the subject.

The grade 'Not evaluable' will be received as long as no more than 30% of the evaluation activities have been delivered.

At the time of carrying out each evaluation activity, the teaching staff will inform the students (Moodle) about the procedure and date for reviewing the grades.

If any irregularity is committed that could lead to a significant variation in the grade of an evaluation act, this evaluation act will be graded 0, regardless of the disciplinary process that may be instituted. If various irregularities occur in the evaluation acts of the same subject, the final grade for this subject will be 0.

Single evaluation

The single evaluation consists of a summary test that includes the contents of the entire theory program with a weight of 60%. On the same day of this test, the exercises corresponding to the classroom practices will also be carried out with a weight of 20%. Before taking the test, an essay must be submitted 30 days in advance, on a topic agreed upon with the teaching staff, with a weight of 20%.

The same criteria regarding irregularities described in the continuous evaluation will be applied.

Bibliography

Barona JL. (2003/1998). Història del pensament biològic. València, Universitat de València, Col·lecció Educació-Materials.

Cummings MR. (2016). Human Heredity. Principles and Issues. 11ena edició. Thompson. Brooks/Cole. Belmont, EEUU.

Jorde LB, Carey JC, Bamshad MJ (2020). Medical genetics. 6a edició. Elsevier. Philadelphia, EEUU. Enllaç: https://www.clinicalkey.com/student/content/toc/3-s2.0-C20190053186

Lewis R. (2021). Human Genetics. Concepts and Applications. 13a edició. McGraw-Hill Science. New York, EEUU.

Monod J. (2000). El Azar y la Necesidad. Barcelona, Tusquets (Metatemas) (1ª ed. 1970).

Morange M. (2000). A history of molecular biology. Harvard: Harvard University Press.

Oriola J, Ballesta F, Clària J, Mengual L. (2013). Genètica Mèdica. Rafael Oliva (ed.) Edicions Universitat de Barcelona. Barcelona.

Schrödinger E. (2001). ¿Qué es la vida? Barcelona: Tusquets (Metatemas) (1ª ed. 1944).

Strachan T i Read AP. (2019). Human Molecular Genetics. 5a edició. Garland Science, Taylor & Francis Group, New York, USA.

Watson JD. (2004). La Doble Hélice. Barcelona: RBA (1ª ed. 1968).

•http://www.ncbi.nlm.nih.gov/omim

•http://ghr.nlm.nih.gov

•http://www.genome.gov

•https://evolution.berkeley.edu/teach-evolution/misconceptions-about-evolution/

Software

This course does not require specific software.

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Spanish	first semester	morning-mixed
(TE) Theory	1	Spanish	first semester	morning-mixed