

Genetics

Code: 100777
ECTS Credits: 6

Degree	Type	Year	Semester
2500250 Biology	FB	1	1

Contact

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Use of languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Prerequisites

There are no prerequisites to follow the course. Nonetheless, it would be desirable that students were familiar with basic knowledge of genetics, cell division, probability and statistics

Objectives and Contextualisation

The main objectives are:

- The understanding of the bases and mechanisms of biological inheritance as well as those of genetic improvement
- The ability to perform genetic analysis of the different characteristics of living organisms
- The ability to design and obtain information on genetic experiments as well as to interpret the results obtained
- The development of a historical vision that allows to summarize the main landmarks of genetics and to assess their contributions to current biology

Content

Theory

1. Introduction to Genetics. The biological inheritance. Genetics as a modern science. Basic ideas about biological inheritance.
2. Nature and organization of the hereditary material. The chromosomes. Cell division. Sexual reproduction and meiosis.
3. Genetic transmission. The works of Mendel. Segregation and dominance. Independent transmission.
4. Extensions of Mendelism. Sex and inheritance patterns. Multiple allele series. Lethality. Gene interaction. Environmental effects.
5. Mapping of eukaryotic chromosomes. Chromosomes and linkage. Recombination. Eukaryotic linkage maps.
6. Mutations. Chromosome variation. Types of chromosome mutations. Chromosomal rearrangements. Changes in chromosome number.
7. Quantitative genetics. Genetic basis of quantitative traits. Statistical analysis of the quantitative traits. Phenotypic variation and heritability. Artificial selection.

8. Population genetics. Genotypic and allelic frequencies. The law of Hardy-Weinberg. The sources of variation.

Classroom problems

1. The hereditary material
2. Monohybridism
3. Inheritance of two or more genes
4. Chromosome linkage and recombination
5. Quantitative genetics
6. Population genetics

Laboratory practices

1. Introduction to the biology and morphology of *Drosophila melanogaster*
2. Analysis of a mutant and assignment to its linkage group
3. Elaboration of a simple linkage map