

Genetics - 6 CFU

Docente: Prof. Mario Augusto Pagnotta

Semestre: secondo

Metodologie didattiche

Get the basic concepts to understand the hereditary mechanisms and genetic bases useful in the evolution of populations and in the management and protection of mountainous and non-mountainous territory.

Lectures, classroom exercises, laboratory and field exercises.

The student will know the genetic bases of natural phenomena and methods to be adopted in order to improve and protect natural and artificial populations.

Programma

Cell cycle and divisions; Chromosome bases of inheritance; Ontogenetic cycles; Determining sex; Mendel's Experiments; Multiple alleles, dominance coding, genetic interactions; Genetic maps; Chemical composition and structure of nucleic acids; Structure of the chromosome; Central dogma; DNA Replication; Transcription, role of regulatory sequences, (exons, introns); Genetic code; Translation and protein synthesis; Gene, chromosomal and genomic mutations; Adjustment of gene expression; Quantitative genetics; Inheritance in the broad sense and in the strict sense, response to selection; Population genetics, Hardy and Weinberg equilibrium; Evolutionary factors: mutations, gene flow, selection and genetic deriva; Their action on Hardy and Weinberg equilibrium.

Testi di riferimento:

Forest genetics / Timothy L. White, W. Thomas Adams, David B. Neale. Wallingford : CABI, 2007

Molecular genetics and breeding of forest trees / Sandeep Kumar, Matthias Fladung editors. Binghamton : Food products press, c2004

Introduction to Genetic Analysis (9th, Ninth Edition) - By Griffiths, Wessler, Lewontin, & Carroll – 2007

Propedeuticità o conoscenze richieste:

Botany, chemistry

Descrizione della metodologia didattica:

Lectures, classroom exercises, laboratory and field exercises.

Esercitazioni e/o altre attività pratiche previste:

Laboratory exercises: DNA extraction; use of molecular markers

Field exercises: sampling.

Classroom exercises: Theoretical exercises, evaluation, management and analyses of some provided data.

Descrizione dei metodi di accertamento e di valutazione:

It will be verified that the expected learning outcomes are actually acquired by the students. The exhibition capacity, completeness and details of the individual topics requested will be evaluated. The ability to link the different topics covered will also be considered. For the attribution of the final grade it will take into account: the level of knowledge of the demonstrated contents (superficial,

appropriate, precise and complete, complete and in-depth), the ability to analyze, synthesize and interdisciplinary links (sufficient, good, excellent) , the ability to criticize and formulate judgments (sufficient, good, excellent), mastery of expression (deficient, simple, clear and correct, safe and correct). In particular, the judgment and the final vote will take into account the knowledge and concepts acquired, the ability to analyze problems, to link interdisciplinary knowledge, to formulate hypotheses and judgments, of mastery and clarity of expression and exposure. The exam will be oral.