

General Information	
Academic subject	Principles of genetics (I.C. Principles of plant physiology, genetics and biochemistry)
Degree course	Bachelor programme: Food Sciences and Technology
ECTS credits	3 ECTS
Compulsory attendance	No
Teaching language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Rosanna Simeone	rosanna.simeone@uniba.it	AGR/07

ECTS credits details	
Basic teaching activities	2 ECTS Lectures 1 ECTS Laboratory classes

Class schedule	
Period	II semester
Course year	First
Type of class	Lecture - workshops

Time management	
Hours	75
In-class study hours	30
Out-of-class study hours	45

Academic calendar	
Class begins	March 1 st , 2022
Class ends	June 17 th , 2022

Syllabus	
Prerequisites/requirements	Knowledge of inorganic and organic chemistry and biology
Expected learning outcomes	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Knowledge on the principal genetic methodologies <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Applying and understanding the principal genetic methodologies for crop and food production <p><i>Making informed judgments and choices</i></p> <ul style="list-style-type: none"> ○ Capacity of apply the principal genetic methodologies for crop and food production <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Capacity of identify the principal genetic methodologies for crop and food production <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Capacity of communicate and continue learning the principal genetic methodologies for crop and food production <p>The expected learning outcomes, in terms of both knowledge and skills, are provided in Annex A of the Academic Regulations of the Degree in Food Science and Technology (expressed through the European Descriptors of the qualification)</p>
Contents	<p>HERITABILITY AND VARIABILITY. Genotype and phenotype. Genetic and environmental variation. The main factors of genetic variation.</p> <ul style="list-style-type: none"> • GENE STRUCTURE AND FUNCTION OF THE DNA and RNA. DNA replication. Process of transcription: gene expression. RNA molecules. Nature of the genetic code. Translation of the genetic message.

	<ul style="list-style-type: none"> • ORGANIZATION AND TRANSMISSION OF HEREDITARY MATERIAL. Organization of DNA in the chromosomes. Chromosomes. Karyotype, Mitosis. Meiosis. Life cycles. • MENDEL'S HEREDITY. Mendel's experiments and principles. Selfing and backcrossing. Heterozygosity reduction and implications for breeding. Statistical analysis of gene segregation. The chromosomal theory of heredity. Interallelic interactions. Epistatic genes. Complementary genes. Multiple alleles and incompatibility in plant species. Characters associated with sex. Association of genes. Crossing over and gene recombination. Mapping genes by testing two points. Genetic maps. • MUTATIONS. Types and origin of mutations. Gene mutations. Chromosomal mutations. Aneuploids. Polyploids.
Course program	
Reference books	<ul style="list-style-type: none"> • Russel P.J., Wolfe S.L., Hertz P.E., Starr C., McMillan B. 2016. Genetica Agraria. EdiSES S.r.l. Ed. • Lorenzetti F., Ceccarelli S., Rosellini D., Veronesi F. 2011. Genetica agraria. Patron Ed. • Barcaccia G., Falcinelli M. 2005. Genetica e Genomica. Liguori Ed. • Griffiths A.J. F., Gelbart W. M., Miller J. H., Lewontin R. C. 2004. Genetica moderna. Zanichelli, Vol. I-II. • Chrispeels M. J., Sadava D. E. 2005. Genetica, Biotecnologie e agricoltura sostenibile. Idelson-Gnocchi • Notes from classes
Notes	
Teaching methods	Lectures will be presented through Powerpoint and overhead. Lecture notes and educational supplies will be provided by means of a mailing list or online platforms (i.e.: Edmodo, Google Drive...)
Evaluation methods	<p>The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures in the classroom and in the laboratory/production plants, as reported in the Academic Regulations for the Bachelor Degree in Food Science and Technology (article 9) and in the study plan (Annex A). Students attending at the lectures may have a middle-term preliminary exam, consisting of a written test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for a year.</p> <p>The evaluation of the preparation of the student occurs on the basis of established criteria, as detailed in Annex B of the Academic Regulations for the Bachelor Degree in Food Science and Technology.</p> <p>Non-Italian students may be examined in English language, according to the aforesaid procedures.</p>
Evaluation criteria	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Knowledge on the principal genetic methodologies <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Applying and understanding the principal genetic methodologies for crop and food production <p><i>Making informed judgments and choices</i></p> <ul style="list-style-type: none"> ○ Capacity of apply the principal genetic methodologies for crop and food production <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Capacity of identify the principal genetic methodologies for crop and food production

	<i>Capacities to continue learning</i> <ul style="list-style-type: none">○ Capacity of communicate and continue learning the principal genetic methodologies for crop and food production
Receiving times	Monday to Friday, 10.30-13.00 a.m. (Define the appointment by e-mail).