



PLANT BIOTECHNOLOGIES	
Enrollment year	2019/2020
Academic year	2019/2020
Regulations	DM270
Academic discipline	BIO/04 (PLANT PHYSIOLOGY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	ADVANCED BIOTECHNOLOGY
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (01/10/2019 - 14/01/2020)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	MACOVEI ANCA (titolare) - 3 ECTS BALESTRAZZI ALMA - 3 ECTS
Prerequisites	Knowledge of Plant Physiology, Molecular Biology and Genetics
Learning outcomes	The course is organized in such a way that the students will be able to develop the following competences: 1. Develop knowledge on the genetic engineering and sustainability methods and capacity to understand the value of these techniques and their use to address the challenges of the 21st century 2. Understanding how to apply this knowledge to improve useful traits for agriculture and industry sectors; learn how to use virtual materials to develop a model for molecular cloning and genetic transformation of plants 3. Develop autonomous evaluation skills: the debates proposed for evaluation purposes will aid students to develop the ability to critically

	analyze the scientific literature, evaluate published results and critically interpret and communicate the outcome of scientific researches 4. Develop communicative skills: the use of interactive instruments supported by the thematic of the course will be useful to develop communication skills 5. Develop the ability to understand and interpret the presented information in the context of the course thematic
Course contents	Module I: Agricultural biotechnology (Anca Macovei). Genetic engineering techniques. Production and classification of genetically modified (GM) plants. Traits of agricultural interest. Tracing GM plants and regulatory science. Applications of plant biotechnology to support sustainable agriculture. Use of plants to combat pollution (phytoremediation). In agreement with the objectives of Agenda 2030 for Sustainable Development, the following objectives will be covered: Objective 2 (Zero hunger), Objective 13 (Climate Action). Module II: Industrial biotechnology (Alma Balestrazzi). Production of pharmaceutical compounds in plants. Green vaccines. Plant bioreactors. Green biofuels and bioplastics. Biotechnological applications for the Seed Industry.
Teaching methods	The course is divided in two integrated modules (48 h): Agricultural biotechnologies (24 h), Industrial biotechnologies (24 h), and will involve the use frontal lessons supported by interactive methods like case-studies, debates, simulations – role playing, cooperative learning, brainstorming, project work.
Reccomended or required readings	Specialized articles on international scientific journals are suggested instead of text books
Assessment methods	The examination is proposed via oral presentations in form of a debate as a collaborative work with groups formed by 2 students which can choose the topic of their presentation based on the thematic of the course. Each team member has 10 min for the presentation, while 10 min are dedicated to the debate between the 2 members of the group and 10 min are dedicated to additional questions from the audience. This methodology was chosen in order to promote the teamwork between students and develop their ability to communicate, form opinions, and pertinently discuss their opinions. The evaluation criteria will take in consideration the creativity, scientific accuracy, clarity and structure of the presentation, the teamwork and the quality of the debate.
Further information	
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile