

Main course information	
Academic subject	BIO/04 Methodologies
Degree course	Biological Sciences
Classe di laurea	L-13
ECTS credits (CFU)	5 (3 CFU Lectures+ 2 CFU workshop)
Compulsory attendance	Yes
Teaching language	Italian
Accademic Year	2019/2020

Docente responsabile	
Name & Surname	Costantino Paciolla
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Tel.	080-5443557
Tutorial time/day	Monday, Wednesday and Friday 1,00-13,00 or by appointment

Course details	Pass-fail exam/Exam with mark out of 30	SSD code	Type of class
	Exam with mark out of 30	BIO/04	Lecture/workshop

Teaching schedule	Year	Semester
	III	II

Modalità erogazione	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	3	24	2	24	0	0	0	0

Time management	Total hours	Teaching hours	Self-study hours
	125	48	77

Academic Calendar	First lesson	Final lesson
	First week of March 2020	First week of June 2020

Syllabus	
Course entry requirements	Knowledge of General Botany and Plant Physiology
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
<i>Knowledge and understanding</i>	Acquisition of knowledge of plant biology necessary to understand experimental methods and protocols in the plant field.
<i>Applying knowledge and understanding</i>	The theoretical acquisitions (carried out in the classroom) and practices (carried out in the laboratory) allow carrying out complex methodological and instrumental procedures. Acquisition of technical skills of micropropagation and of "in vitro" culture of plant tissues.
<i>Making informed judgements and choices</i>	Autonomy in the use and application of experimental protocols on plant matrices. Ability to know how to choose and apply the most appropriate methodology in plant studies.
<i>Communicating knowledge and understanding</i>	Acquisition of a lexicon and appropriate terminology related to the specific plant discipline.
<i>Capacities to continue learning</i>	Acquisition of skills in the organization of one's work in the laboratory and in the critical capacity of the results obtained.

Consultation of bibliographic and site information will allow to be always updated about new knowledge and development of the discipline.

Syllabus

Course content	<p>Lectures</p> <p>In vitro cultures: definition and its characteristics. Composition of a culture medium and development of an in vitro culture. Totipotency of the plant cell. Plant regeneration. In vitro micropropagation. Direct and indirect organogenesis and embryogenesis. Somaclonal variation. Protoplasts. Protoplast fusion. Synthetic seeds. Haploid plants. Vegetable callus. Cell cultures. Production of secondary metabolites from cell cultures.</p> <p>Laboratory</p> <p>The laboratory activities are conducted in parallel with the topics of the lectures. In vitro plant culture experiments in solid and liquid media. Preparation of the culture medium. Weigh of all the substances to set up a culture medium using analytical and preparative balances. Weigh of micro- and macroelements. Bring the culture medium to pH and final volume. Addition of agar. Use of the autoclave for liquid medium sterilization. Distribution of the liquid medium in plate. Callus culture plates. Preparation of vegetable explants. Calluses from different plant explants. Observation and description of plant callus cultures. Preparation of the culture medium in glass tubes for seed germination in vitro. Sterilization of seeds and their in vitro germination. Isolation of protoplasts from leaves of tomato plants grown in a growth chamber. Sowing, rearing and sample collection. Preparation of solutions. Observation and yield of the protoplasts under the microscope.</p>
Course books/Bibliography	<p>Lecture notes</p> <p>Recommended book</p> <p>Barcaccia-Falcinelli: Genomica e Biotecnologie genetiche vol. III - Liguori Editore.</p>
Notes	Lecture Power Points are available as support to the study.
Teaching methods	Lectures with the use of PowerPoint.
Assessment methods (indicate at least the type written, oral, other)	<p>Oral exam. The exam includes three oral questions concerning lectures and practical laboratory activities. The evaluation expresses sufficiency with the vote of 18/30. The maximum vote is 30/30.</p> <p>POINTS:</p> <p>Null 1-6 Seriously insufficient 7-12 Insufficient 12-17 Sufficient 18-21 Good 22-24 Very good 25-27 Excellent 28-30</p> <p>The attribution of “30 cum laude” takes place in exceptional cases in which the student, having obtained the maximum possible evaluation within the pre-established parameters, presents further or extraordinary merits (e.g. clear and brilliant exposition, further details), emerged during the exam.</p>
Evaluation criteria (Explain for	Learning of the theoretical and practical contents performed throughout the course.

each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are	Autonomy in choosing the most appropriate methodological survey for a given plant problem. Acquisition of specialist terminology related to the specific plant discipline. The appropriate level of communication skills will be assessed during lectures, the experimental laboratory and the final oral exam.
Further information	