



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Agrarie, Alimentari e Forestali		
<b>ACADEMIC YEAR</b>	2021/2022		
<b>BACHELOR'S DEGREE (BSC)</b>	AGRICULTURAL SCIENCES AND TECHNOLOGIES		
<b>SUBJECT</b>	BIOTECHNOLOGIES AND NURSERY FOR WOOD SPECIES		
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	D		
<b>AMBIT</b>	10517-A scelta dello studente		
<b>CODE</b>	21859		
<b>SCIENTIFIC SECTOR(S)</b>	AGR/03		
<b>HEAD PROFESSOR(S)</b>	ALLEGRA ALESSIO	Ricercatore a tempo determinato	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>			
<b>CREDITS</b>	3		
<b>INDIVIDUAL STUDY (Hrs)</b>	45		
<b>COURSE ACTIVITY (Hrs)</b>	30		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	2		
<b>TERM (SEMESTER)</b>	2° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	ALLEGRA ALESSIO Tuesday 8:00 10:00 edificio 4 ingresso H		

DOCENTE: Prof. ALESSIO ALLEGRA

<b>PREREQUISITES</b>	Basic knowledge of Arboriculture and Fruitculture and of general and systematic botany.
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding: at the end of the course students will have specific knowledge concerning woody species.</p> <p>Applying knowledge and understanding: the knowledge and skills' acquired will allow the student to apply in practice the conventional and innovative techniques of propagation of woody species and to process them according to specific technical requirements.</p> <p>Making judgments: students will be able to suggest the adoption of technologies and devices to improve the quantitative and qualitative level of the final plant as well as to know the propagation of main woody species, according to the specific features of company.</p> <p>Communication skills: the student will be able to use a simple and proper language, even with stakeholders who do not have a scientific background, in presenting the development or research projects, and in addressing the breeders and the nurseries and seed companies</p> <p>Learning skills: the knowledge acquired will allow the student to interact with specialists in the field of propagation of these species and to use effectively and autonomously the technical and scientific sources of the sector upgrading.</p>
<b>ASSESSMENT METHODS</b>	Learning is assessed through an interview. The questions (usually three or four), open or semi-structured, tend to test knowledge, acquisition of interpretative skills, capacity of connecting and processing the topics, as well as a relevant presentation capacity. The final grade will be expressed in thirtieth and will be judged insufficient when the student will demonstrate: difficulty to focus on the proposed topics, a shallow knowledge of the topics and an extreme limited exposure ability. As the degree of details of the proven knowledge increase will proportionally increase the positivity of the grade. The maximum score is obtained in case of excellent mastery and critical-interpretative jurisdiction of the subject content of the course, a good exposition and the use of proper scientific terminology.
<b>EDUCATIONAL OBJECTIVES</b>	This course will provide information on the state-of-the-art of some aspects of plant biotechnology and on the opportunities, limitations, and possible development of green biotechnology applied to fruit crops breeding and propagation, with specific reference to fruit crops. Particular emphasis will be given to the importance and utilization of in vitro tissue culture for fruit crop propagation and genetic improvement.
<b>TEACHING METHODS</b>	Lectures, laboratory, tutorials.
<b>SUGGESTED BIBLIOGRAPHY</b>	Plant propagation, principles and practices. Harmann and Kester's Hartmann; Kester; Davies, Jr.; Geneva. Biotechnologie delle colture frutticole. Sussidio didattico a cura di S. Sansavini e M. Pancaldi. Clueb Bologna E. Baldini - Arboricoltura generale - Clueb References provided during the course. Lecture notes.

## SYLLABUS

Hrs	Frontal teaching
1	Introduction, objectives and description of the course.
2	Woody plant. Fruit crops: variety and rootstocks
2	Woody plants in the Mediterranean area.
2	Biodiversity of fruit crops.
4	Seed Propagation: Seed Production Systems. Seed-Propagated Cultivars and Species. Seed quality, collection and conservation, Dormancy, Germination, Seedling Production Systems. Vegetative Propagation: Cuttings, factors affecting rooting. Grafting, Seedling and Clonal Rootstock Systems, Graft Incompatibility, Layering, Clones, Mutations, Chimeras, Apomixis.
2	Innovative methods applied to nursery technique. Nursery industry characteristics. Genetic-sanitary certificate information.
4	In vitro morphogenesis: organogenesis, somatic embryogenesis.
3	Micropropagation: steps, objectives, methodologies, perspectives. Somaclonal variation. In vitro germplasm preservation.
2	Sanitation: Nucellar lines; In vitro shoot-tip grafting
1	Embryo rescue.
1	Molecular markers applied to nursery and fruit crop breeding. MAS
Hrs	Workshops
6	Culture Media preparation. Explant sterilization and culture. Synthetic seed preparation. In vitro shoot-tip grafting.