COURSE OF STUDY *Agricultural Sciences and Technologies (L-25)*
ACADEMIC YEAR *2023-2024*
ACADEMIC SUBJECT *Fruit tree science*

General information	
Year of the course	First
Academic calendar (starting and ending date)	Second semester (February 26th – June 14th, 2024)
Credits (CFU/ETCS):	6
SSD	Tree crops (AGR/03)
Language	Italian
Mode of attendance	No compulsory but suggested

Professor/Lecturer	
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Department and address	DiSSPA-Fruit tree unit 5th floor
Virtual room	Microsoft Teams: code *09rlsfk*
Office hours (and modalities: e.g., by appointment, on line, etc.)	Every day from 8.30 to 13.30 pm according to a scheduled appointment. Tutoring could be also done on online platforms (Teams).

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
150	32	28	90
CFU/ETCS			
6	4	2	

Learning Objectives	At the end of the course the students will acquire the basic knowledge on the organography, morphology, physiology of fruit tree species in the Mediterranean basin. The effects of climatic conditions on fruit tree species, together with vegetative and reproductive cycles and plant propagation will also be explained. Knowledge on cultural practices, training systems and fruit ripening will also be acquired.
Course prerequisites	Knowledge of botany.

Teaching strategies	The topics of the course will be presented with Power Point presentations, videos, classroom or laboratory/field activities, case studies, webinars, workshops. The e-learning modality can be used in some situations (disabled students, foreigners, workers, athletes, etc.) using online platforms such as Teams.
Expected learning outcomes in terms of	

Knowledge and understanding on:	• Knowledge of the morphological aspects of fruit tree species. • Knowledge of physiology applied to fruit tree species in the Mediterranean basin by using different sources (scientific papers, experimental data, etc.). • Knowledge of the principles and applications of orchard management to fruit tree species (from propagation to harvesting). • Knowledge of the morpho-physiological aspects related to the ripening of the different types of fruit.
Applying knowledge and understanding on:	• Ability to evaluate the influence of environmental factors on the physiological aspects of fruit tree species. • Ability to evaluate the influence of cultural practices on both the physiological and quantitative-qualitative aspects of fruit productions from a perspective of environmental and economic sustainability. • Ability to evaluate the fundamental criteria related to the optimal ripening of the fruit in relation to the destination of the product.

Soft skills	• Making informed judgments and choices:
	  ○ Ability to correctly suggest the choice of suitable fruit species/varieties in the different cultivation areas.
	  ○ Ability to evaluate the physiological aspects in the different environments with practical implications on the production.
	  ○ Ability to critically evaluate the use of different cultivation techniques for a sustainable management of the fruit species.
	• Communicating knowledge and understanding:
	  ○ Ability to expose the acquired skills by using an appropriate language.
	  ○ Ability to describe, also through applicative cases, the practical aspects and potential effects of this discipline on both field and research.
	• Capacities to continue learning:
	  ○ Ability to deepen and update the acquired knowledge on fruit tree species.
	  ○ Ability to extend the knowledge acquired during the course through the reading and understanding of scientific and technical texts.

Syllabus	
Content knowledge	• Morpho-physiological aspects of fruit tree species. Root system; canopy; vegetative cycle; reproductive cycle. • Physiology and environment. The physiology of fruit trees in different environments. • Propagation. Sexual and vegetative. • Pruning and training systems. Winter and summer pruning. Trellising systems. • Management of the orchard. Principles of irrigation, fertilization and soil management. • Ripening and quality of fruit. Physiological aspects of fruit growth and ripening. Time and types of harvesting. Quality indices.
Texts and readings	• Lecture notes and files given during the class. • Principi di Arboricoltura. Peano e Sottile. 2019. Edises. • Arboricoltura generale. Sansavini S., Costa G., Gucci R., Inglese P., Ramina A., Xiloyannis C. 2012. Pàtron editore S.r.l. • Coltivazioni arboree. Baldini e Marangoni. 1997. Thema Club.
Notes, additional materials	• Scientific papers to improve the acquired skills.
Repository	All teaching material will be available to students on web platforms (class Teams code *09rlsfk*).

Assessment	
Assessment methods	For students enrolled in the year of the course in which the teaching is carried

	out, a mid-term test is scheduled. The mid-term test consists of an oral test on the topics developed during the lesson hours in the classroom and in the laboratory/field. The mid-term test will be assessed out of thirty and in the event of a positive outcome, in the subsequent oral test (second part) the exam will focus on the topics developed during the lesson hours in the classroom and in the laboratory/field until the end of the course. The outcome of this test contributes to the evaluation of the final exam and is valid for one academic year. The exam consists of an oral test on the topics developed during the lesson hours in the classroom and in the laboratory/field, as reported in the Didactic Regulations of the Degree Course in Agricultural Sciences and Technologies (Article 9) and in the study plan (Annex A). For foreign students, the examination procedure consists of an oral test in English on the topics covered during class hours.
Assessment criteria	• Knowledge and understanding: o Description of the main morpho-physiological characteristics of fruit tree species. o Knowledge of the principles and criteria underlying pruning, grafting and trellising of fruit tree species. o Knowledge of the mechanisms underlying the ripening of the fruits and quality indices commonly used. • Applying knowledge and understanding: o Applying the acquired knowledge on the vegetative and reproductive cycle of fruit tree species in different pedo-climatic areas. o Applying the knowledge of cultural practices for a sustainable management of the orchard. o Applying the most appropriate propagation techniques for the different fruit tree species. • Autonomy of judgment: o Correctly suggest the application of the best and modern cultural practices for an optimal physiological management of the fruit trees. o Evaluate the physiological/phenological criteria (chilling hours, heat requirement, critical temperatures, etc.) to be considered either before planting an orchard or for its management. o Give accurate and appropriate tools to face the physiological problems occurring in the field. • Communication skills: o Explain the acquired skills with a language appropriate to the topics discussed. o Ability to organize the acquired knowledge in the form of a presentation for either didactic-training or technical purposes. • Capacities to continue learning: o Manage fruit tree species/varieties based on physiological and environmental needs to optimize the production response in terms of quantity and quality. o Broaden the acquired knowledge through in-depth analysis of technical and scientific texts of the fruit tree area, attending seminars, webinars, etc.
Final exam and grading criteria	The assessment of the student's preparation takes place on the basis of pre-established criteria, as detailed in Annex A of the Academic Regulations of the Degree Course in Agricultural Sciences and Technologies (expressed through the European Descriptors of the degree). For students who have taken the mid-term test, the evaluation of the exam is expressed as the average between the mark obtained on the mid-term test and

	the final exam. The final mark is in 30 points. The test is passed with a mark higher or equal to 18. By unanimous vote of its members, the Board may award honours in case where the final mark is 30.
Further information	