UNIVERSITÀ DI PISA

FRUIT SCIENCE I

RICCARDO GUCCI

Anno accademico	2020/21
CdS	AGRICULTURAL SCIENCES
Codice	022GG
CFU	9

Moduli	Settore/i	Tipo	Ore	Docente/i
ARBORICOLTURA GENERALE	AGR/03	LEZIONI	84	RICCARDO GUCCI

Learning outcomes

Knowledge
At the end of the course students will have the knowledge background on main fruit tree species and the main processes responsible for tree productivity, product quality, adaptation to the environment and orchard sustainability. Students will have an understanding of the decision making processes regarding orchard management, nursery production and sustainable use of resources.

Assessment criteria of knowledge
Students' performances will be tested orally during a final exam. Students will also be asked to answer questions during lectures and practical sessions. At the end of the course two hours will be dedicated to problem solving and preparation for the exam.

Skills
At the end of the course students will have a theoretical and practical background to understand and make decisions in management of orchards and nurseries. Students will also be able to face and solve problems arising at the environmental level.

Assessment criteria of skills
Students' competence will be tested by questions during lectures and practical sessions. In addition, students are requested to prepare 10 tables of main fruit tree species that will allow them to become familiar with the different plant organs and to identify those species.

Behaviors
Students will be able to:
- identify organs and main fruit tree species
- undertand processes underlying fruit production in trees
- identify training systems and design the best pruning technique
- determine tree water requirements
- design the tree fertilization plan

Assessment criteria of behaviors
Oral exam.

Prerequisites
Soil science
Agronomy
Plant physiology

Teaching methods
Lectures are conducted using slides and drawings. Practical sessions are conducted in the laboratory, field and greenhouse.
Students are invited to make an appointment with the instructor for specific problems. Appontments will be online as long as current pandemics last.

Syllabus

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The fruit industry in Italy and in the world. Developmental biology of fruit trees and vines: vegetative activity. Temperature requirements. REproductive biology flower induction, differentiation, anthesis, pollination, fruit set. Fruit growth and development: ftuit abscission, maturation and ripening. Yield componenti della and factors affecting yield. Source-sink relationships. Fruit competition and thinning. Carbon assimilation and partitioning. Water relations and transpiration. Resistance to abiotic stresses. Criteria for orchard design and management: row orientation, planting distance pruning and training systems. Evolution of pruning and training systems. Irrigation. Fertilization. Soil management in the orchard. Propagatione of fruit trees and vines. Lab and field practice Morfology, organ description and classification of main fruit trees and vines of the temperate zone. Practical identification of main fruit trees and vines. Pruning fruit trees and vines (training, production). Basics of the apple, peach, grapevine and olive industries in Italy.

Bibliography

Recommended reading includes the following book: 1) Sansavini S., Costa G., Gucci R., Inglese P., Ramina A., Xiloyannis C. (editors). 2019. Principles of modern fruit science, ISHS, Leuven, Belgium, ISBN-978-94-6261-204-4. Supplementary information can be found in: 2) Sansavini S. (a cura di) 2007. Nuove frontiere dell'arboricoltura italiana. Oasi A. Perdisa, Bologna, 562 p. 3) Baldini E. 1986. Arboricoltura generale. CLUEB, Bologna 4) Branzanti C.E., Ricci A. 1981. Manuale di frutticoltura. Edagricole, Bologna 5) Hartmann T.H., Kester D.E. 1990. Propagazione delle piante: basi scientifiche e applicazioni tecniche. Il Sole 24 ore Edagricole, Bologna 6) Faust M. 1989. Physiology of temperate zone fruit trees. John Wiley & Sons, New York.

Non-attending students info

Slides supplied by the instructor, the textbook by Sansavini et al. 2019, and appointments with the instructor are sufficient to prepare the exam. Topics can be viewed in the lecture diary published on line.

Assessment methods

Oral exam. T

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