



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	
<b>ACADEMIC YEAR</b>	
<b>ANNO ACCADEMICO EROGAZIONE</b>	
<b>SUBJECT</b>	
<b>CODE</b>	
<b>SCIENTIFIC SECTOR(S)</b>	
<b>HEAD PROFESSOR(S)</b>	<b>SORTINO GIUSEPPE</b> Ricercatore a tempo determinato Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	
<b>CREDITS</b>	
<b>PROPAEDEUTICAL SUBJECTS</b>	
<b>MUTUALIZATION</b>	
<b>YEAR</b>	
<b>TERM (SEMESTER)</b>	
<b>ATTENDANCE</b>	
<b>EVALUATION</b>	
<b>TEACHER OFFICE HOURS</b>	<b>SORTINO GIUSEPPE</b> Monday 12:00 14:00 Viale delle Scienze, Ed. 4, Ingresso H, studio H-19 Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF) Tuesday 12:00 14:00 Viale delle Scienze, Ed. 4, Ingresso H, studio H-19 Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF) Wednesday 12:00 14:00 Viale delle Scienze, Ed. 4, Ingresso H, studio H-19 Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF) Thursday 12:00 14:00 Viale delle Scienze, Ed. 4, Ingresso H, studio H-19 Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF)

<p><b>PREREQUISITES</b></p>	<p>Elements of Mathematics. Good knowledge of Botany, with particular reference to Morphology, Biology and Plant Systematics; The extensive and in-depth knowledge of Agronomy and is fundamental. Basic knowledge of General Chemistry and Organic Chemistry suggested.</p>
<p><b>LEARNING OUTCOMES</b></p>	<p>Knowledge and understanding: at the end of the course the student will have specific knowledge concerning the fruit cultivation managed according to the horticultural principles of organic farming.                  Ability to apply knowledge and understanding: the acquired knowledge and skills will allow in practice to apply the conventional and innovative cultivation techniques of fruit trees, as well as to have in-depth knowledge of genetic improvement and propagation to the main fruit tree species and to re-elaborate them in relation to specific technical requirements.                  Autonomy of judgment: the student will be able to suggest the adoption of cultivation and products conservation of fruit trees, and will be able to advise the adoption of technologies and arrangements to improve the qualitative level of products, in short term through horticultural management; in long term by breeding programs, in relation to the specific characteristics required from the fruit industry..                  Communication skills: the student will be able to use a simple and correct language, even with persons not involved in horticulture, in presenting development and / or research projects, and in directing producers and processing and transformation of the productions obtained from the fruit trees and the related nursery companies. Learning Capabilities: the acquired knowledge will allow the student to interact with fruit sector specialists and use profitable and autonomous sources of technical and scientific updating of the sector.</p>
<p><b>ASSESSMENT METHODS</b></p>	<p>The oral test consists of an interview; the final evaluation is expressed in thirtieths                  The questions, open or semi-structured and specifically designed to test the learning achievements, tend to verify:                  a) the acquired knowledge and the ability to establish connections between the contents (general sections, special sections, models, etc.) of both modules ;                  b) the ability to provide independent judgments about the contents of the course and to place the contents of the course within the professional and technological context. The maximum score is achieved if the test ensures the full possession of the following: ability to represent emerging and/or minor issues of the discipline; strong ability to represent the impact of the course content within the sector where content enroll; ability to represent ideas and/or innovative solutions within the professional and technological context;                  c) adequate exhibition capacity: the maximum scoring can be achieved by persons who demonstrate complete fluency of the scientific and technological language, while the minimum scoring will be achieved if the examinee demonstrates a proper use of the language but not sufficiently articulated in relation to the professional context.                  Final notes go from 18 to 30 points. The student is required to answer at least 2 or 3 oral questions regarding the whole program of study with reference to the suggested books. Questions shall assess a) Knowledge and understanding; b) cognitive and practical skills; c) ability to communicate; d) Making judgements                  Note European Qualifications Framework                  - 30 - 30 cum laude a) advanced knowledge of a field of work or study, involving a critical understanding of theories and principles; b) advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study; c) fully adequate use of specialized language; d) take responsibility for managing and innovate the study field.                  - 26 29 a) comprehensive, specialised knowledge within a field of work or study and an awareness of the boundaries of that knowledge; b) a comprehensive range of cognitive and practical skills required to develop creative solutions to problems; c) comprehensive use of specialized language d) exercise management and supervision in contexts of work or study activities.                  -22 25 a) knowledge of facts, principles, processes and general concepts, in a field of work or study; b) basic skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information; c) basic capacity to use specialized language; d) basic capacity to take responsibility for completion of tasks in work or study.                  -18-21 a) basic general knowledge, b) basic skills required to carry out simple tasks; c) basic capacity to communicate relevant informations; d) basic capacity to take responsibility for completion of tasks in work or study.                  Compensatory tools and dispensatory measures will be guaranteed by the Disability and Neurodiversity Center - University of Palermo (Ce.N.Dis.) to students with disabilities and neurodiversity, based on specific needs and in implementation of current legislation.”</p>
<p><b>EDUCATIONAL OBJECTIVES</b></p>	<p>The course aims to extend to the student a broad and precise vision of the entire production sector, starting by the knowledge of organography,</p>

	<p>reproductive biology and ecological requirements of the fruit tree species. The student who will have attended the course will have all the technical knowledge to design a new orchard and manage it according to the principles of "precision horticulture" and to manage an already established orchard, optimizing, if required, crop management. Student will also learn the criteria to select cultivars, rootstocks and to perform the appropriate horticultural practices to obtain products that contain molecules that promote the well-being and health of the consumer. These include those with antioxidant and anti-inflammatory action. Practised mainly in small and medium size farms, organic fruit production is destined to middle and high income consumers, who evaluate the product on the basis of the ability to meet specific hedonistic and / or nutritional-health needs, traits for which they are available to pay a higher price. In order to satisfy this above mentioned market segment the technician will have to be able to stress factors that differentiate the organic fruit, based on chemical and organoleptic quality traits or environmentally friendly production practices. Can help to enhance the attractiveness of the product, adopting, if possible, different certification systems ("C free", Environmental Product Declaration, Protected Denomination of Origin (POD), Protected Geographical Indication). However, considering that a significant part of the organic fruit market will have to satisfy requirements of consumers who take care of the sale price, technical know-how for the adoption of technologically advanced farming systems that will help to reduce crop costs by unit, is crucial for this consumer segment. In order to obtain typical fruits at low prices, it is necessary for the technician to have the skills to extend to the grower horticultural strategies in order to choose the best cultivar/rootstock combinations for the different growing environments in order to be able to enter, at sustainable costs, in the market segment of "exclusive" products.</p>
<b>TEACHING METHODS</b>	<p>Large part of the course consists in frontal lessons, held with the aid of projections of images, diagrams, videos prepared by the teacher. Laboratory activities to evaluate the qualitative characteristics of fruits are also included as well as practical exercises aimed at improving the knowledge on the morphology and the biology of the fruiting of the various tree species; particular care will be paid to the management of the soil, with special emphasis to the proper use of cover crops. Technical visits to the regional fruit industry in the Sicilian territory will be planned in accordance with the students attending the course.</p>
<b>SUGGESTED BIBLIOGRAPHY</b>	<ul style="list-style-type: none"> <li>- Arboricoltura speciale Gentile A. , Inglese P. , Tagliavini M., Edagricole-New Business Media. ISBN 978-88-506-5616-5</li> <li>- Principi di Arboricoltura Andreotti C., Continella A., Gallotta A.; Giacalone G., La Malfa S., Liguori G., Peano C.; Pisciotta A., Scandellari F., Sortino G., Sottile F., Zanotelli D.. EdiSes s.r.l.-Napoli. ISBN 978 88 3319 0372</li> <li>- Arboricoltura Generale. Sansavini S., et al. – Patròn (2012).ISBN: 8855531891</li> <li>-Frutticoltura Speciale AAVV. Reda Ed.1991. ISBN-10: 0000132462</li> <li>- Manuale di Frutticoltura Branzanti E.C. e Ricci A. -, Edagricole. 2009. ISBN 978-8850600472</li> <li>-Monografie della collana "Coltura &amp; Cultura" (melo, pero, pesco, uva da tavola, agrumi, ulivo) edite da Bayer CropScience srl Milano.</li> <li>- Materiale didattico aggiornato (presentazioni ppt; video; appunti, riviste) sarà distribuito dal docente durante il corso. PPT presentations, videos, scientific and technical journals will be distributed by the teacher during the course.</li> </ul>

## SYLLABUS

Hrs	Frontal teaching
4	Fruit growing in the world: specie, countries, production, international trade
2	Horticultural aspects of organic fruit growing
2	Planning and setting up an organic production orchard: horticultural aspects for the selection of the site
2	Propagation, quality and certification of planting stock
4	Planting systems for the various species: planting densities; tree distances, orchard design, training systems

## SYLLABUS

Hrs	Frontal teaching
16	Choice of cultivar and rootstocks for various species: Deciduous fruit trees originated in temperate zones : peach, nectarine, apricot, cherry, plum, apple, pear, quince, table grape, fig, pomegranate, diospirosus. Fruit trees producing dry fruits: almond, pistachio, hazelnut, walnut Evergreen fruit trees: olive, carob, pricly pear Subtropical fruit trees: Citrus (lemon, orange, mandarine, clementine); loquat. Tropical fruit trees: avocado, mango, litchi, anona.
16	Horticultural techniques delivered to the canopy management: shaping, pruning, flower/fruit thinning, harvesting
4	Fruit development, ripening stages, harvest indexes
2	Harvesting methods
4	Fruit sorting and processing
Hrs	Others
20	Technical tour to the Sicilian fruit industry