# .- Viticulture II – Cultivation Techniques

## Prof. Stefano Poni

***Text under revision. Not yet approved by academic staff.***

COURSE AIMS AND INTENDED LEARNING OUTCOMES

Provide students, based on the general concepts learnt in the Viticulture I course, with the elements needed to efficiently design and manage a vineyard. The intended learning objectives are detailed below.

Knowledge and understanding

At the end of the course, students will possess the fundamental notions of applied physiology of the vine, and will know the factors that influence the vineyard ecosystem in order to correctly design and efficiently manage the vineyard. Students will also learn the traditional and innovative techniques necessary for the management of foliage and vineyards.

Applied knowledge and understanding

At the end of the course, students will be able to design a new vineyard in terms of choosing the cultivation site, the materials and the planting density. Students will also possess the physiological foundations for identifying the most appropriate foliage management, water-mineral nutrition and soil management techniques, differentiating the time and intensity of intervention according to environmental needs and different oenological objectives. With reference to the most recent solutions available on the market, students will also have useful elements for conducting technical-economic evaluations of the automation and mechanisation of different cultivation and harvesting techniques.

Autonomous judging skills

With the aim of training new professional figures such as company directors, consultants and experts in the wine sector, students will be able to evaluate the technical and economic convenience of various cultivation techniques, including the mechanisation of the main operations involved in managing the vineyard and the harvest.

Communication skills

Students will be able to correctly describe, both verbally and in writing, the state of the vineyard and will also be able to address various problems related to the design and management of the vineyard through the use of appropriate technical terminology.

Ability to learn

At the end of the course, over and above the topics covered in class, students will be able to increase their knowledge in aspects of general viticulture and vineyard management through self-consultation of books and treatises, websites, scientific and technical journals.

COURSE CONTENT

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|  | ECTS |
| Propagation of the vine. Planting of the vineyard: preparation and arrangement of the soil, basal dressing, choice of materials and planting pattern. Soil management: grassing, processing, weeding and mulching | 1 |
| Cultivation and production pruning: physiological principles and methods of execution. Forms of vine cultivation: classification, selection criteria, management techniques, economic aspects. | 1.5 |
| Canopy management and summer pruning: suckering, pollarding, trellising, topping, defoliation, and thinning of the bunches. | 0.5 |
| Vine nutrition: needs of the species, deficiency symptoms, diagnostic techniques and the principles of soil and foliage fertilisation. Irrigation: effects of water inputs as a function of phenological phase and watering volume. Water balance of the vineyard: entry and exit aspects. Efficiency in the use of water and irrigation systems. | 1 |
| Mechanisation of the main crop operations (harvesting, winter and summer pruning). Machine-cultivation system integration. Operational and economic aspects. Notes on precision viticulture applications and the adaptation of cultivation techniques to climate change. | 1 |
| TUTORIALS. Field visits for demonstrations of cultivation techniques. | 1 |

READING LIST

Lecture notes.

For further information on specific topics, please refer to the following texts:

A. Palliotti, S. Poni, O. Silvestroni, *Manuale di viticoltura,* Edagricole-New Business Media, 2018.

A. Palliotti, S. Poni, O. Silvestroni, *La nuova viticoltura,* Edagricole, 2015.

Poni S., 2022. *Progettare e gestire il vigneto sostenibile in un’era di cambiamento climatico*. Self-published, can be ordered online on Amazon.

Further reading references related to the topics covered in class will be indicated during the course. Any additional material and whatever is projected in class will be made available on the Blackboard platform.

TEACHING METHOD

The course teaching will be carried out through the following activities:

1) Frontal lectures in which the lecturer will address the course contents by combining concepts and notional aspects with various application examples. The interactions between lecturer and students will be promoted through the discussion of specific case studies.

2) Classroom and outdoor tutorials to determine the nutritional status of the vineyard and the preparation of the most appropriate fertilisation strategy according to the requirements of different management systems (conventional, sustainable or organic viticulture). Students will also have the opportunity to view and test some canopy management techniques.

3) Field visits for a better understanding of how different vineyard design and management solutions can be adopted according to environmental needs and different oenological objectives.

ASSESSMENT METHOD AND CRITERIA

Final oral exam. The exam consists of at least three questions of a general nature, from which further specific questions may arise. Comprehensive answers to each topic are worth 10/30. The final mark will be out of 30. Pass mark: ≥18/30.

Students must show a) mastery of the main techniques of vineyard management, both in terms of their theoretical knowledge acquired (know-how) and their ability to use this in specific operational contexts according to current technical solutions and oenological objectives set, with a view to the economic and environmental sustainability of modern viticulture (know-how); b) clarity of language; c) ability to connect different topics.

NOTES AND PREREQUISITES

For a fruitful understanding of the topics covered during lectures, students must possess a basic knowledge of general arboriculture and vine morphology and physiology.

Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=Eng or on the Faculty notice board.