

Course title	Management of soil fertility in mountain vineyards
Module title	Chemistry of fertilizers and mineral nutrition in grapevine (free choice course)
Course code	44617
Course credits	5 ECTS
Scientific sector	AGR/13
Degree	Viticulture, Enology and Wine Marketing
Semester	I
Year	II
Academic year	2019/2020
Credits	3 ECTS
Modular	Yes
Total lecturing hours	Frontal/regular lectures: 16 h;
Total exercise hours	Laboratory exercise: 12 hours;
Attendance	Not compulsory
Prerequisites	-
Course page	-
Lecturer	Stefano Cesco
Teaching language	English
Office hours	Upon arrangement by email
Targeted learning outcomes:	The course aims at improving the knowledge about the mechanisms underlying the soil availability, root uptake, translocation and allocation of mineral nutrients in grapevine plants. This knowledge will allow the students

	to manage the fertilization practices in vineyards according to the physiological needs of plants.
Content:	General aspects of ion uptake mechanisms in plants: short (roots) and long (xylem and phloem) transport and allocation. Ion uptake by leaves (mechanisms underlying foliar fertilization). Usable forms in the soil-plant system, specific mechanisms of acquisition, plant contents, metabolic functions, symptoms of deficiency/excess, fertilizers and their field application of macro (N, P, K, Ca, Mg, S) and micronutrients (B, Zn, Fe, Cu) in relation to a sustainable and efficient use of the sources. Practical laboratory exercise on topics discussed during the classes.
Teaching format	Regular lectures: power point presentation and blackboard
Exam form:	Assessment (<i>at the end of the course</i>) is conducted via oral examination that includes a) questions to assess the knowledge and understanding of the course topics and b) questions designed to assess the ability to transfer these skills to case studies of grapevine production. Space will also be dedicated to the evaluation of the ability to rework the experience of the laboratory. Attribution of a single final mark awarded based on the following criteria: the clarity of the response, the ability to summarize, evaluate, and establish relationships between topics, the independence of judgment, the ability to rework.
Literature:	Mineral Nutrition of Higher Plants, Ed: Petra Marschner, Academic press, 2012, ISBN: 978-0-12-384905-2 The Science of Grapevines, Anatomy and Physiology. Second Edition. Markus Keller Published by Elsevier Inc. 2015, ISBN: 978-0-12-419987-3

Course title	Management of soil fertility in mountain vineyards
Module title	Soil and water management in grapevine production (free choice course)
Course code	44617
Course credits	5 ECTS
Scientific sector	AGR/03

Degree	Viticulture, Enology and Wine Marketing
Semester	I
Year	II
Academic year	2019/2020
Credits	2 ECTS

Total lecturing hours	Frontal/regular lectures: 12 h;
Total exercise hours	exercises in open field (vineyards) and/or visits to wine producing farms in mountain areas: 6 hours;
Attendance	Not compulsory
Prerequisites	Students should have at least a basic knowledge of arboriculture and general viticulture.
Course page	-
Lecturer	Zanotelli Damiano
Teaching language	English
Office hours	Upon arrangement by email
Targeted learning outcomes:	<p>The course will provide students with scientific and technical knowledge on the main aspects related to soil and water management in vineyards located in mountain areas.</p> <p>Students will consider different irrigation methods and new emerging water management technics which are used to increase water use efficiency, to help regulating canopy vigour and possibly to increase grape quality.</p> <p>Regarding the soil management, students will be provided with knowledge on the current grass management practices in mountain viticulture and the possible benefits deriving from soil amendments application.</p>
Content:	<p>The course consists of two sections:</p> <p><u>Section 1: water management</u></p> <ul style="list-style-type: none"> - Overview of irrigation methods applied in mountain viticulture (drip, subsurface irrigation, fertigation) - Irrigation water management techniques capable to save water, increase its use efficiency and provide other benefits such as control of canopy vigour and possibly improve grape quality (deficit irrigation)

	<p>(DI), regulated deficit irrigation (RDI) and partial root drying)</p> <ul style="list-style-type: none"> - Sensors and technology available to monitor soil water content in the vineyard as well as the soil-plant water status <p><u>Section 2: soil management</u></p> <ul style="list-style-type: none"> - Overview of mechanical and technical methods for the grass management of both row and inter-row in mountain viticulture. - Possible benefits for soil and water management related to the application of soil amendments
Teaching format	Power point slides
Exam form:	Oral exam
Literature:	There are no specific textbooks on the course topics. The lecturer will provide students with the pdf of the lectures and with selected papers from the international literature on the subject.