COURSE DESCRIPTION

Students will deepen knowledge related to grapevine ecophysiology in order to master solutions suitable to solve practical issues in the vineyard. The course will include new perspectives bound to climate change and to a more efficient use of water and nutrient resources.

COURSE CONTENTS

Bases of environmental physiology: yield formation, yield potential and its realization. Grape composition and fruit quality: water, sugar, acids, nitrogen compounds and mineral nutrients, phenolics, lipids and volatiles. Xylem and phloem function.

Environmental constraints and grape physiology: responses to stress. Water: too much or too little? Nutrients: deficiency and excess. Salinity. Temperature: too cold or too warm?

Climate change and impact on viticulture: main features of climate change and its effects on viticulture. Adaptation and mitigation techniques. New tools for better assessment and prediction of climate-change related effects and for prevention of climate extremes.

Physiology of pruning and canopy management: winter pruning: an ideal case for applied physiology. Physiology of main summer pruning techniques: shoot thinning, shoot trimming, leaf removal, cluster thinning. Methods for assessing efficiency of different training systems.

Water relations and water use efficiency:. Stomatal action and transpiration. Isohydric and anisohydric adaptation to water stress. Definition and ways of assessment of water use efficiency (WUE) Water relations and nutrient uptake.

Invited seminars on specific topics. Audio-video listening of lectures and working groups. Discussion of case studies.

SCHEDULE
Spring Semester

PREREQUISITES
None.

METHOD OF TEACHING
35 teaching hours (indoor) + 12 hours (practices). Lectures, seminars and educational field trips.

COURSE REQUIREMENTS
It is strongly recommended to attend classes. The teacher will provide teaching materials in class.

CREDITS
6 ECTS

GRADING

Final written test will be made of 18 questions. Three of them will be open questions valued 5/30 each. The remaining 15 will be multiple choice questions valued 1/30 each.

COURSE READINGS AND MATERIALS

M. Keller. *The science of grapevines*. Elsevier, 2010.

P.Iland, P. Dry, D. Profitt, S. Tyerman. *The Grapevine: from the science to the practice of growing vines for wine*. P. Iland Wine Promotion, 2012.

A. Palliotti, S.Poni, O. Silvestroni. *La nuova viticoltura*. Edagricole, 2015 (in Italian).

Additional reading materials will be handed out during the course.

INSTRUCTOR BIO
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