COURSE DETAIL

PLANT INTERACTIONS WITH GLOBAL CHANGE
Country Italy
Host Institution University of Bologna
Program(s) University of Bologna
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Environmental Studies Biological Sciences
UCEAP Course Number 182
UCEAP Course Suffix
UCEAP Official Title PLANT INTERACTIONS WITH GLOBAL CHANGE
UCEAP Transcript Title PLANT&GLOBAL CHANGE
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description

This is a graduate level course that is part of the Laurea Magistrale program. The course is intended for advanced level students only. Enrollment is by consent of the instructor. At the end of the course, students will have acquired knowledge on the main morphological, physiological and molecular responses of higher plants to environmental cues and the basic mechanisms of tolerance and adaptation to adverse conditions. They learn about how plants contribute to air quality by the release of biotic particulates and by interfering with air pollutants derived from anthropogenic activities. Due to changes in plant distribution in relation to climate change, students become acquainted with the contribution of alien species to the release of such biotic particulates. Students also learn about methods employed in aerobiology for the quantitative and qualitative assessment of pollen and other air-borne allergens. They gain the capacity to interpret data and critically read scientific literature relating to this topic. Course contents Module 1: role of native and alien plants on air quality synthetic description of plant anatomy and cytology; the adaptive strategies of plants to different environmental conditions; alien plants; aerobiology; pollen and pollination; main airborne bio-allergens: pollens and fungi; food allergens of plant origin and respiratory allergens of pollen origin; role of plants as organisms able to monitor the environmental quality and to influence it through the release of aero-dispersed biological material such as pollens; possible use of plants in environmental phytoremediation. Course contents Module 2: plant resilience to environmental stress; the course will deal with the main responses of higher plants to environmental cues and basic mechanisms of tolerance and adaptation to adverse conditions; introduction to plants and abiotic stress factors associated with climate change; overview of abiotic stress responses in plants at various levels: morphological, physiological, biochemical, and molecular; the role of compatible solutes in preventing damage under stress conditions; oxidative stress, ROS homeostasis, and the importance of enzymatic and non-enzymatic antioxidants; responses and management of salinity stress in plants; symbiotic interactions between plants and soil microorganisms under environmental stress; plant hormones: definition, classes, modes of action and involvement in abiotic stress; gene expression and environmental changes; involvement of microRNAs, transcription

factors, and epigenetic changes in stress responses; abiotic stress and secondary metabolites, including VOCs.

Language(s) of Instruction
English

Host Institution Course Number
88848

Host Institution Course Title
PLANT INTERACTIONS WITH GLOBAL CHANGE (LM)

Host Institution Course Details

Host Institution Campus
SCIENZE

Host Institution Faculty

Host Institution Degree

Host Institution Department
Scienze e gestione della natura

Course Last Reviewed

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