COURSE DETAIL

GLOBAL CHANGE OF HUMAN MODIFIED ECOSYSTEMS
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 175
UCEAP Course Suffix
UCEAP Official Title GLOBAL CHANGE OF HUMAN MODIFIED ECOSYSTEMS
UCEAP Transcript Title GLBL CHNG ECOSYSTEM
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description

This course is part of the Laurea Magistrale program. The course is intended for advanced level students only. Enrollment is by consent of the instructor. Students learn the conceptual foundations to understand the interactions between natural and social systems in globally changing urban landscapes (terrestrial, freshwater and marine), and gain analytical basic urban-ecology tools to be applied in urban monitoring, planning, and restoration. The students are introduced to urban areas as novel ecosystems, and learn about the unique ecological conditions and functioning of cities and waterfronts, the environmental challenges and opportunities of a sustainable urban development, and the principles and strategies for biodiversity conservation, restoration and management in a human-modified context. They are introduced to ecosystem services concepts and how to use them in an interdisciplinary analysis. They also learn the direct and indirect effects of human impact with particular attention to freshwater ecosystems as Highly Modified Bodies (WFD 2000/60/CE definition). Students obtain the ability to read and understand articles in the field of urban ecology, sustainability and restoration science, to synthesize and communicate interdisciplinary research, and gain insight on how to identify appropriate solutions for urban planners, policy makers, and managers. Students also get the opportunity to develop a field-work proposal for a restoration project in an highly modified area. Course topics: principles of urban ecology and the concept of novel urban ecosystems; unique (man–made) ecological conditions of urban ecosystems– land (and sea) use cover; urban climate and the heat island effect; changes in the physical environment (soil/sediment properties, hydrological processes and (sea)water characteristics); impacts of pollution, noise, artificial light and electromagnetic fields; patterns of urban biodiversity and controlling factors– impacts of urbanization on biodiversity and changes in biodiversity along urban-rural gradients; losers and winners in urban habitats, homogenization and the susceptibility of urban ecosystems to species invasions; effects of altered disturbance regimes; habitat transformation, fragmentation and loss in urban land/seascapes, altered connectivity, and dispersal barriers and corridors; ecosystem functions and services in urban landscapes- urban biodiversity and ecosystem services; valuing the role of

natural ecosystems in flood risk reduction and nature-based adaptation; ecosystem management options to enhance resilience of society and the environment to future climate conditions; principles of sustainable urban development–urban footprint, sustainability, and governance-related challenges in urban environments; natural capital and strategies for biodiversity conservation; indicators of environmental quality in urban environments (e.g. the city biodiversity index, the Ocean health index, etc.); management of multiple stressors and stakeholders; bioengineering, multifunctional blue/green infrastructures; conservation and restoration in an urban context; ecological concept from natural to modified freshwater ecosystems structure and functions, impact of human activities; HMWBs and AWBs (highly modified and artificial water bodies) in the Water Directive WFD (2000/60 EU); reservoirs and dams–impact and benefit; ecosystem services of natural versus modified rivers within sustainable development strategy; the blue imprint of cities and water scarcity; monitoring of HMWBs and AWBs: hydromorphology and biomonitoring; biodiversity conservation in HMWB and AWBs; multifunctional natural infrastructures; Common European implementation strategy on HMWBs; restoration of HMWBs and AWBs; Navile and canals of Bologna: opportunity to develop restoration proposals.

Language(s) of Instruction
English

Host Institution Course Number
88386

Host Institution Course Title
GLOBAL CHANGE OF HUMAN MODIFIED ECOSYSTEMS

Host Institution Campus
SCIENZE

Host Institution Faculty

Host Institution Degree

Host Institution Department
Scienze e gestione della natura

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