

COURSE DETAIL

HYDRAULIC AND BIOENERGY

Country

Italy

Host Institution

University of Bologna

Program(s)

University of Bologna

UCEAP Course Level

Upper Division

UCEAP Subject Area(s)

Environmental Studies Engineering

UCEAP Course Number

164

UCEAP Course Suffix**UCEAP Official Title**

HYDRAULIC AND BIOENERGY

UCEAP Transcript Title

HYDRLIC & BIOENRGY

UCEAP Quarter Units

6.00

UCEAP Semester Units

4.00

Course Description

This course is part of the Laurea Magistrale degree program and is intended for advanced level students. Enrollment is by permission of the instructor.

This course consists of two modules: Marine Renewable Energy and Bioenergy, Hydrogen, and Heat Recovery Systems.

For Marine Renewable Energy, students acquire the ability to assess marine renewable energy potential and to conceptually design energy devices. They are able to assess marine energy potential (wind, waves, tides, currents, etc.) and have knowledge about devices for marine energy harvesting and technological challenges, and assessment of environmental, social, and economic impacts. The module covers the following topics: Marine renewable energy: sources (wind, wave, tide) and variability; Type of marine renewable energy converters; Environmental impact and cost of MRE devices; Optimal mixing of MRE; Multi-use marine areas and integration of different economic activities: MRE, aquaculture, tourism, maritime hubs; and Re-purposing of O&G platforms.

Bioenergy, Hydrogen and Heat Recovery Systems module provides the student with knowledge and understanding about: Biomass and alternative fuels for energy application: production, treatment and storage, thermochemical conversion, environmental and economic aspects; Hydrogen for energy and transport applications: characteristics, production, gas-to-power (G2P) and power-to-gas (P2G) systems, technologies for upgrading fuels (synthetic methane), fields of application, integration into the existing infrastructure; Heat recovery systems: cycles and working principle of the main heat-to-power (H2P) technologies (Organic Rankine Cycle and Stirling engine). After completion of the course the students should (i) gain general competence related to bioenergy and hydrogen-based systems and their potential in future energy supply; (ii) working with cross-cutting problems related to bioenergy and hydrogen; (iii) analyzing potential and characteristics of Organic Rankine Cycle systems heat recovery from medium and low-temperature heat sources.

Language(s) of Instruction

English

Host Institution Course Number

98774

Host Institution Course Title

HYDRAULIC AND BIOENERGY

Host Institution Course Details

<https://www.unibo.it/en/study/course-units-transferable-skills-moocs/course-uni...>

Host Institution Campus

BOLOGNA

Host Institution Faculty**Host Institution Degree**

LM IN GREENING ENERGY MARKET AND FINANCE

Host Institution Department

STATISTICAL SCIENCES

Course Last Reviewed

2025-2026

[Print](#)