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Università Iuav
di Venezia

Engineering for renewable energy in coastal environment master's degree



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Why Università Iuav di Venezia

Venice is at the heart of an extremely diverse and delicate ecosystem.

It is internationally acknowledged as a paradigm of resilience to climate change. Therefore, it is the ideal city to host the innovative master's degree programme "Engineering for renewable energy in coastal environment"

in the field of "Environmental and Land Engineering" (ministerial degree code LM-35) offered by Università Iuav di Venezia to train engineers capable of safeguarding coastal environments from environmental threats.

This master's degree is run in collaboration with the Institute of Marine Sciences (ISMAR) of the National Research Council (CNR), also based in Venice, to enrich the teaching programme with experiments, and calculation and simulation tools used by the most advanced research institutes. In the surroundings, students can explore coastal and marine sites of high environmental value and carry out experimental activities directly related to the topics covered.

Moreover, the academic tradition of Università Iuav di Venezia in territorial planning and landscape clearly distinguishes the study programme that combines hard sciences with the study of landscape and social acceptability of environmental interventions.

Students can also benefit from the well-established student mobility network of Università Iuav di Venezia.

Learning objectives

This master's degree trains professionals capable of managing the complex and interdisciplinary process of designing infrastructures and systems to achieve sustainable development goals, with a focus on coastal environments.

Graduates are expected to acquire the following skills, listed by scope:

- design and certification of renewable energy systems (photovoltaic systems, biomass systems, wind turbines, wave-based energy generation systems, etc.);
- design and certification of water supply chains with low environmental impact
- ecological modelling and environmental impact assessment
- coastal landscape design.

To achieve these targets, graduates acquire the cross-cutting competencies briefly listed below:

- identification of key variables and critical aspects for the definition of environmentally sustainable projects
- identification of key characteristics to describe coastal environments and their interaction with the marine environment
- collection and post-processing of geo-referenced data
- advanced knowledge in mathematics, physics, and chemistry
- skills in technical reporting that enable

graduates to interact with international professional partners

- modelling of marine environments to manage low-impact environmental interventions.

The result is a professional figure with a marked multidisciplinary, able to plan and manage interventions in coastal environments, even on a large scale, and to collaborate with technicians and designers from other disciplines.

Students will participate in internships organised by the University in agreement with public and private entities. Internships allow students to apply what they have learned during their studies in the real world.

The master's degree thesis consists of an extensive design activity characterised by research aspects to be implemented in collaboration with public and private entities operating in environmental interventions and/or related research activities.

The thesis allows students to expand their acquired knowledge with a focus on a research and development perspective.

The study programme includes a single specialisation track, but students have 24 CFU (university credits) available to tailor their study path.

Why this study programme is different

The features that differentiate this study programme from others already present in the area are:

- modules that integrate various disciplines, both horizontally and vertically, allowing students to consolidate skills and knowledge through the vertical or horizontal

complementarity of different disciplines

- the provision of advanced skills in chemical-physical modelling and calculation to enable graduates to predict in detail the effects of environmental interventions in a coastal context

- the provision of skills in the design of renewable energy systems specific to the marine environment, such as wave-based energy systems and offshore wind energy systems, which are often not covered by master's degrees in the same area

- a considerable multidisciplinary, with subjects ranging from advanced numerical skills to the acceptability of renewable energy sources, from environmental modelling to risk analysis
- a high level of internationalization thanks to the choice of teaching in English.

Courses

First year

Technical reporting

Chemistry and processes of coastal environments

Marine fluid dynamics and coastal engineering

Modelling and data analysis for coastal engineering

Water as a renewable energy source

Planning sustainable and resilient coastal environments

Water supply, drainage, and treatment in coastal areas

GIS and satellite and digital survey of coastal environments

Second year

Legal framework for maritime space
Interdisciplinary energy analysis and
environmental economics
In-shore infrastructures and renewable
energies
Ecology of marine environments
Environmental and Energy assessment
Structural design and risk analysis
Internship
Thesis

Courses chosen by students among the following

Calculus and machine learning
for environmental modelling
Modelling and planning for energy
efficiency, noise control and lighting
Geopolitics and energy through the
Mediterranean Sea
Digital Tools for Advanced Maritime
Spatial Planning and Management

contacts

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