

Venice Water Lab

Venice is the oldest city of the future. In the post-sustainability era, it becomes the space where strategic visions, advanced planning, and institutional components converge to bring forth the Venice Water Lab – a centre of excellence conceived to build a better future for our planet. Water today stands as our most precious and vital resource, and it is the element that will most profoundly shape the near future of our world. For this reason, the sea represents the ideal environment for constructing a new post-sustainable perspective – especially one as stratified and rich in environmental, logistical, socio-cultural, and historical-identity implications as that of Venice. The Università Iuav di Venezia has established the Water Lab to make it an authoritative and distinguished international centre for higher education and research on water and marine issues. The Venice Water Lab embodies, first and foremost, the lagoon environment – a confluence of freshwater and saltwater – and stands as a vibrant, contemporary fragment of a millennial history intimately linked to the resources of water and the sea. The central theme of the Venice Water Lab is the sea and the water cycle within post-sustainable equilibrium systems. Its objective is to reimagine the Blue Planet, positioning Italy at the forefront of Blue Growth and the Blue Economy. Venice Water Lab represents the most innovative collaborative experiment among State Administrations, working together on a common project in a systemic and synergistic manner – conceptualizing and implementing concrete forms of planning while developing effective solutions to global challenges. The Università Iuav di Venezia is

collaborating, among others, with the Venice Maritime Military Studies Institute (ISMM) of the Italian Navy and the National Research Council (CNR), with further partnerships with other universities and advanced research centres. The academic programme encompasses courses that explore the theme of water in all its dimensions: from infrastructures beneath and above the surface – both current and future – to physical communications; from the renewable energies of today and tomorrow to the spatial planning of the sea, a hallmark of Venetian studies. In Venice, students and researchers could also benefit from the city’s extraordinary quality, its rich cultural offerings, and its comprehensive services, within an international environment and an artistic and natural context unlike any other in the world. The educational programme of the Water Lab is designed to cultivate professional profiles capable of meeting the demands of the public sector while anticipating the challenges of a rapidly evolving private labour market. All courses affiliated with the Water Lab are taught in English.

Venice Water Lab - Master’s

- | Master’s Degree in Renewable Energy Engineering in Coastal Environments
- | Master’s Degree in Sustainable transportation and smart maritime mobility
- | MSc in Urban and Spatial Planning for Transition

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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RENEWABLE ENERGY ENGINEERING IN COASTAL ENVIRONMENT



MASTER’S DEGREE
PROGRAMME

Master's degree programme in Renewable Energy Engineering in Coastal Environment

Why Università luav 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 "Renewable Engineering Energy in Coastal Environment" in the field of "Environmental and Land Engineering" (ministerial degree code LM-35)" offered by Università luav 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 luav 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 luav 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 of renewable energy systems (photovoltaic systems, biomass systems, wind turbines, wave-based energy generation systems, etc.);
- design 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 highly multidisciplinary professional figure, able to plan and manage interventions in coastal environment 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, to apply their knowledge into the real world.

The thesis allows students to expand their acquired knowledge with a focus on a R&D perspective. The study programme includes a single specialisation track, but students have 24 CFU (ECTS) available to tailor their study path.

CAREERS

Work/consulting in:

- Public authorities at various territorial levels (e.g., Managers and concessionaires of territorial and environmental projects or Organizations and institutions involved in territorial planning and management);
- Professional studios;
- Practice as self-employed professionals (after professional qualification exam, where needed);
- Training and research & development, in universities and public/private research institutions.

Entry requirements

- Bachelor Degree in Environmental Engineering or Civil Engineering
- Any other Bachelor Degree which provided: 30 ECTS in fundamental scientific disciplines such as Informatics, Algebra, Geometry, Mathematical analysis, Probability and statistics, Numerical analysis, Statistics, General and inorganic chemistry, Chemical foundations of technologies, Experimental physics, Applied physics; 60 ECTS in applied disciplines such as Hydraulics and marine constructions, Sanitary and environmental engineering, Highways, railways and airports, Transportation, Topography and cartography, Geotechnics, Structural engineering, Drawing, Urban and regional planning, Ecology,

Applied geology, Applied geophysics, Energy systems and power generation, Building physics and building energy systems, Applied physical chemistry, Chemical technologies, Engineering of raw materials, Electrical engineering, Business and management engineering, Systems and control engineering, Administrative law, etc.;

- Good proficiency in written and spoken English (B2 level in QCER)

Why this study programme is different

The following features differentiate this study programme from others:

- modules integrating various disciplines, both horizontally and vertically, thus students consolidate skills and knowledge through complementary disciplines
- advanced skills in chemical-physical modelling and calculation to enable graduates to predict in detail the effects of environmental interventions
- skills in the design of renewable 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

VENICE WATER LAB

MASTER'S DEGREE
PROGRAMME

