

ORGANIZING UNIVERSITIES



emana zabal zazu

Universidad  
del País Vasco



University of  
Strathclyde  
Glasgow



NTNU

Norwegian University of  
Science and Technology



CENTRALE  
NANTES

IMPORTANT INFORMATION

- **Location:** UPV/EHU (Spain), Strathclyde (UK), ECN (France) and NTNU (Norway)
- **Type of master:** Erasmus Mundus
- **Type of learning:** On-Campus
- **Language:** English
- **Calendar:** 2018 - 2020 (4 semesters)
- **Teaching load:** 120 ECTS (90 teaching + 30 master's thesis)
- **Scholarships available** (Erasmus Mundus funding)
- **Supported by:** + 35 entities

CONTACT AND INFORMATION

**Main contact:** info@master-rem.eu  
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**Website:** master-rem.eu

 Co-funded by the  
Erasmus+ Programme  
of the European Union



Erasmus Mundus  
Joint Master Degree

MASTER IN  
RENEWABLE ENERGY  
IN THE MARINE  
ENVIRONMENT

master-rem.eu



OVERVIEW

The Master in Renewable Energy in the Marine Environment (REM) is an Erasmus Mundus Joint Master Degree (EMJMD) offered by four universities: the University of the Basque Country, the University of Strathclyde, the Norwegian University of Science and Technology and École Centrale de Nantes.

The master is co-funded by the Erasmus+ Programme of the European Union.

PRESENTATION AND GOALS

Renewable energy plays a more and more important role. At a social level, renewable energy contributes to a more sustainable energy system, by providing a more independent power system and contributing to the reduction of global warming and climate change.

Offshore renewable energy has a vast potential, but they represent a major technological challenge. The harsh conditions offshore demand advanced specific knowledge in various scientific and technological fields, and specifically trained professionals are demanded by this industry.

The aim of the REM master is to form specialists with the required skills to accomplish this technological challenge.

The Master provides the student with skills in assessment, analysis, simulation, development and exploitation of all available energy in the marine environment and in project development of safe, efficient and reliable marine energy generation plants, including operation and maintenance design and study of the integration of the plants in the electric system.

The Master program is fully presented in English and classes are presented by professors of University of the Basque Country, Strathclyde University (UK), Ecole Centrale de Nantes (France) and NTNU (Norway), and professionals from the supporting companies and institutes.

The master also offers the possibility to develop the Master’s thesis in one of the supporting entities and it offers a number of scholarships.

PROFESSIONAL OUTINGS

The completion of the master will prepare the student for a leadership role in various renewable energy and marine sectors. Students will be able to carry out high-level technical jobs in engineering companies, equipment manufacturers and other marine industries.

Marine and renewable energy companies and institutions increasingly demand specifically trained professionals with an advanced specific knowledge in various scientific and technological fields. This programme trains the student to face the technological challenges that harsh conditions offshore require.

Likewise, students will also be able to pursue research positions in Universities, Research and Development in technological poles, and other institutes.

Moreover, this programme has a network of associated centres formed by several world-renowned research institutions and companies entailing a great career opportunity for students.

Not only they have a direct participation in the master teaching and hosting students for their master thesis but they also recognise that the learning outcomes of the REM programme are suitable for positions in their institutions/companies.

ACADEMIC PROGRAMME

The Programme is a two years masters’ course consisting of 4 semesters of study (120 ECTS), in accordance with the ECTS (European Credit Transfer System).

Student mobility is compulsory so that each student must undertake the Programme by enrolling at three of the four partner universities (including for completion of a master thesis).

ECTS credits are assigned to Modules. Each student will be assigned to a Supervisor. An individual study plan must be then elaborated and mutually agreed between the student and his/her Supervisor.



MODULES AND SUBJECTS

MODULE 1. Resource and marine environment

- Ocean wave energy and offshore wind energy assessment
- Water waves and sea states modelling

MODULE 2. Theoretical foundations: early marine energy conversion

- Inspection and survey
- Control Principles
- Advanced fluid dynamics modelling for marine engineering applications
- Theoretical and numerical aspects in fluid dynamics and turbulent flow
- Computational fluid dynamics for turbulent flow
- Modelling of wind/marine current turbine-driven electric generators
- Wave to wire control
- Applied electromagnetics in power engineering
- General concepts of hydrodynamics
- Numerical hydrodynamics
- Experimental hydrodynamics

MODULE 3. Conversion technologies

- Wind Energy and Distributed Energy Resources
- Renewable marine energy systems
- Power electronics in future power systems
- Wind power in electric power systems
- Marine renewable energy

MODULE 4. Connection and integration into the electricity grid

- Power Electronics Devices, Drives Machines and Applications
- Integration of renewable energy into the electricity system
- Operation of transmission and distribution networks
- Power electronics in offshore power systems
- Power electronics
- Power system analysis
- Quality of supply in electrical power systems

MODULE 5. Engineering, development and management of offshore parks

- Physical model testing for offshore renewables
- Advanced Marine Structures
- Environmental conditions for marine renewable concepts
- Operations and maintenance of marine energy arrays
- Wave-structure interactions and moorings

MODULE 6. Environmental, economic and legal aspects of marine renewable energy

- Energy economics
- Environmental Impact Assessment

MODULE 7. Local culture

- Basque language and culture
- French language and culture

APPLICATION PROCEDURE

Applicants are required to complete the online application, providing documents and forms available through the REM website. The procedure has 2 steps:

1. Completing the online application form.
2. Attaching the required documents to the application form.

The deadline for returning the application form and the required documentation will be announced on the REM website but will normally be before 15th of March every academic year.

ERASMUS MUNDUS SCHOLARSHIPS

Erasmus Mundus scholarships are open to higher education Third Country and European students and academics from all over the world.

Erasmus Mundus scholarship covers tuition fees, participation costs (including insurance coverage), travel cost contribution, installation cost contribution, and monthly allowance.

MASTER’S THESIS

A student may commence research for the thesis project (30 ECTS) just after successfully progressing to Semester 3. The thesis can be undertaken in one of the four organizing Universities or in one of the Associate Centres.

SUPPORTED BY

