

International Master's Degree Reliability based Structural Maintenance for Offshore Renewable Energy (MAREENE)

Training
100% online



This program aims to train structural reliability, monitoring and maintenance specialists in the field of offshore renewable energy (ORE). At the end of this program, you will be able to use and quantify the added value of non-destructive testing techniques and SHM methods applied to offshore structures.

The program is completely online.

You will first acquire the scientific and technological knowledge necessary to prepare the second part of the training. Then, you will conduct a project/internship in a company or an academic research lab, for example in one of the partner universities Nantes University (NU), Aalborg University (AAU), Norwegian Science and Technology University (NTNU) or in their network, and have the opportunity to develop the practical experience necessary to your future career. You will also participate to online peer-learning activities to enrich your knowledge.

The Master programme is accredited by the French Ministry of Higher Education, Research and Innovation (2nd year of master Mechanical Engineering). After completion, students will be awarded a master degree delivered by Nantes Université.



Start date and duration

September 2024 to september 2025
340 hours

Cost

Varies according to status and number courses to be taken. Contact us.

Accessibility



Skills

General skills

- Analyze and model a problem
- Perform numerical calculations with uncertainties
- Identify a model

Transversal skills

- Analyse the results obtained
- Communicate orally and write the results or a methodological or technical study in a synthetic and pedagogical way
- Produce a bibliography (state of the art) of the works on a technical subject in order to apprehend the globality and the scope of the treatments, and to self-train
- Lead a project from the description of its specifications to its fulfillment

Specific skills

- Identify needs for offshore renewables based on basic design of offshore renewable energy structures
- Define the basic elements of the calculation of complex structure reliability and be able to apply them to real situations
- Identify, select and quantify the added value of Non Destructive Tools and SHM systems
- Evaluate information and optimise the maintenance of offshore renewable energy structures in terms of reliability and cost (risk analysis)
- Work in a team for the fulfillment of projects in an international context

Registration

[Complete the online form.](#)



Learning resources

Virtual classes, vidéos, documents, technical support (hotline), e-learning platform (Extradoc), pedagogical forum ...

Teaching methods

Teaching is based on alternating theoretical contributions (virtual classes, videos, documents), and practical application through interactive activities, application exercises, case studies and individual or group projects.

Assessment

Assessments are in the form of continuous assessments or final exams. They include assignments and projects submitted, as well as the completion of exercises, the quality of exchanges and students' attendance.

Contact

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Third Semester (30 ECTS) (i.e. first semester of this second year of master)

- MRE structures: offshore wind energy and ocean energy (18h)
- Design of offshore structures (34h)
- Stochastic theory of sealoards (34h)
- Numerical methods for uncertainty quantification (32h)
- Risk based inspection and value of information (33h)
- Risk and reliability in engineering (60h)
- Monitoring strategy and monitoring systems (32h)
- Wind loads on structures (25)
- Technical communication (20h)
- Problem Based Learning (PBL)(29h)

Fourth Semester (30 ECTS)(i.e second semester of this second year of master)

- Internship or project (23)

Requirements

- ~ To enter this second year of master, applicants should hold a 4 year degree in higher education, equivalent to the first year of a master (i.e. a 3-year Bachelor is not acceptable), for example a 1st year of MSc validated in a field related to the scientific field of the master. Applicants must demonstrate good bases in Finite Element Methods, structural computation, and basic knowledge on reliability. Applicants should be able to demonstrate their knowledge from transcripts of their degrees. The program is completely delivered in English. Students whose first language is not English must provide proof of a minimum knowledge in English.

Career Opportunities

Sectors

Energy Sector, Offshore Renewable Energy, electricity, gas, oil, nuclear.

Occupations

- Higher education and academic research
- Research and Development functions
- Structural Health Monitoring (SHM) specialists
- Researcher (after a PhD)
- Project Manager

Why choosing this program ?

This program has been developed by researchers and teachers-researchers experts in the structural health monitoring of offshore structures from European universities of renown in that field.

Nantes Université :

Sea and Littoral Research Institute, involved in numerous industrial partnerships, also welcomes the TRUST group, a research group focused on modelling the reliability of structures and developing sensors architectures.

NTNU

Marine Technology Department specialises in load computing, force analysis, design methods and structural analysis.

AAU

Department of Civil Engineering involved in the development of reliable offshore structures and an internationally recognized research group on issues of probabilistic methods and decision making in monitoring and maintenance planning.

