UN e-SEA
Nantes Université

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

Training 100% online

This programme 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 programme is completely online.

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

The master's programme is accredited by the French Ministry of Higher Education, Research and Innovation (2nd year of the master's in Mechanical Engineering). On completion, students will be awarded a master's degree by the University of Nantes.

Skills

General skills

- Analyse and model a problem
- Perform numerical calculations with uncertainties
- Identify a model
- Analyse the results obtained

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

Start date and duration

Start in september
340 hours

Cost

Varies according to status
and number of courses to be taken
Preferencial partner rates. Contact us.

Accessibility

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

Assessment takes the form of continuous assessments or final examinations. They include submitted assignments and projects as well as the completion of exercises and student attendance.

Registration

Complete the online form

Contact

contact.unesea@univ-nantes.fr

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Syllabus

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 sealoads (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 (25h)
- 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 (23h/tutoring)

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. Candidates must have a good grounding in finite element methods, structural analysis and basic knowledge of 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.

Example of students'profiles:

- Students who have completed 4 years of higher education (a bachelor + 1 year)
- Master 2 students from a partner institution
- Professional looking for specialisation

Why choosing this programme ?

Top European Universities

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.
https://english.univ-nantes.fr/

NTNU
Marine Technology Department specialises in load computing, force analysis, design methods and structural analysis.
https://www.ntnu.edu/imt

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.
en.build.aau.dk

Flexible programme

Whether you are a university student or an employee looking for a specialisation, this programme is for you, thanks to a mix of synchronous and asynchronous courses delivered entirely online.

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

This programme is labeled by EMC2, the French industrial cluster dedicated to advanced manufacturing technologie and the pole of competitiveness on the sea economy «Pôle Mer Bretagne Atlantique »

This programme is supported by the West Atlantic Marine Energy Community (WEAMEC)

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