SHAKE THE FUTURE.





2ND AND 3RD YEAR SPECIALISATION

OCEAN: HYDRODYNAMICS AND MARINE ENGINEERING

Provide the students with the scientific and technical knowledge in hydrodynamics and ocean engineering to allow them to address societal issues linked mainly to energy (offshore oil, marine renewable energies) and maritime transport (building of environmentally-friendly ships and transport of offshore wind turbines).



COURSE CONTENT

- > Introduction to hydrodynamics
- > Marine environment and hydrodynamic loads
- > Seakeeping and stability
- > Numerical hydrodynamics: Part 1
- > Ship manoeuvrability and moorings
- > Experimental hydrodynamics
- > Lifting bodies and propulsion
- > Numerical hydrodynamics 2

- > Shipbuilding and maritime economy
- > Fluid-structure interaction
- > Advanced hydrodynamics
- Project

OPTIONS:

- > Marine Renewable Energies (20 students)
- Offshore oil and gas (10 students)







INDUSTRY SECTORS

- > Offshore oil
- > Marine Renewable Energies
- > Naval engineering
- > Maritime transport
- > Research (private or public sector)
- > Coastal engineering
- > Numerical simulation in hydrodynamics and fluid mechanics

CAREER PROSPECTS

- > R&D engineer
- > Installation and operations engineer (MRE offshore)
- > Project engineer
- > Quality engineer
- > Production management engineer
- > Supply chain manager

TEACHING STAFF

HEAD OF SPECIALISATION:

Félicien Bonnefoy

CENTRALE NANTES LECTURERS:

Sandrine Aubrun, Félicien Bonnefoy, Isabelle Calmet, Antoine Ducoin, Guillaume Ducrozet, Pierre Ferrant, David Le Touzé, Zhe Li and researchers from the Research Laboratory in Hydrodynamics, Energetics & Atmospheric Environment (LHEEA)

EXTERNAL SPEAKERS:

Academics: Université de Nantes, École navale (Brest), ICAM Nantes

Naval architecture: HT2

Marine Renewable Energies: Innosea, EDF-EN, Naval Group

Offshore oil: Principia, Total, Saipem, Subsea 7

EXAMPLES OF PREVIOUS PROJECTS

- > Numerical simulation of cylinders for riser sizing (HydrOcean)
- Numerical study of the aerodynamic performance of a vertical axis wind turbine (LHEEA)
- > Influence of anchor modelling on the performance of a wave energy convertor (Innosea)
- > Design and build of two electrically propelled boats (Hydrocontest student competition)
- > Exploratory study for the deterministic measurement and prediction of sea states (LHEEA)
- > Architecture of a floating wind farm (LHEEA)
- > Characterization of the small wave tank (LHEEA)

EXAMPLES OF PREVIOUS INTERNSHIPS

- > Hydrodynamic study of a sailing project, K-epsilon, Sophia Antipolis.
- > Naval design and engineering studies, Marc Lombard, La Rochelle.
- > Study of models using coastal environment software MIKE FM (DHI, Denmark)
- > Offshore data analysis and study of anchor line fatigue (Exeter University, UK)
- > Modelling of the dynamic behaviour of an anemometer (Ecole Navale, Brest)
- > Calculation in the naval field, Segula Engineering, Saint-Herblain.
- > Study of an offshore facility (Innosea, Edinburgh, UK)

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Centrale Nantes is a French engineering school and member of the Ecoles **Centrale Group**. Its graduate, master and PhD programmes are based on the latest scientific and technological developments and the best management practices. Founded in 1919, Centrale Nantes' 40-acre campus welcomes 2320 students, including 1550 graduate students, 150 Executive Education and degree apprenticeship students, 240 PhD students and 380 Master and Advanced Master students.