



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

- > Marine environment & hydrodynamic loads
- > Numerical hydrodynamics 1
- > Introduction to hydrodynamics
- > Seakeeping and stability
- > Numerical hydrodynamics 2
- > Experimental hydrodynamics
- > Ship manoeuvrability and moorings
- > Lifting bodies & propulsion
- > Project 1
- > Advanced hydrodynamics
- > Shipbuilding & maritime economy
- > Fluid-structure interaction
- > Marine wind energy
- > Project 2
- > Internship





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), Vincent Leroy

EXTERNAL SPEAKERS:

Academics: Université de Nantes, ICAM Nantes

Naval architecture: H&T

Marine Renewable Energies: Innosea

Offshore oil: Principia, Total

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EXAMPLES OF PREVIOUS PROJECTS

- > Large-scale modelling of coastal currents (Naval Group)
- > Floating wind farm architecture (LHEEA-CN)
- > Numerical simulation of cylinders for riser sizing (HydroOcean)
- > Numerical study of the aerodynamic performance of a vertical axis wind turbine (LHEEA-CN)
- > Flow control in the naval sector (Naval Group)
- > Study of innovative anchoring systems for floating wind turbines (Innosea)
- > Neptune project - Design of a sports catamaran made from biocomposite (G. Dupont)
- > Anchor-line fatigue and sensitivity to environmental conditions (LHEEA-CN)

EXAMPLES OF PREVIOUS INTERSHIPS

- > Aeroelastic calculations with hydrodynamic coupling on offshore wind turbines, Bureau Veritas, France
- > Offshore data analysis and study of anchor line fatigue, University of Exeter, England
- > Modelling the dynamic behaviour of an anemometer, Ecole Navale, Brest
- > Study of models using the coastal environment software MIKE FM, DHI company, Horshol, Denmark
- > Study of an offshore facility, Innosea, Edinburgh, Scotland
- > Estimation of hydrodynamic loading on wind turbines installed on the sea bed, EDF-EN, France

