



2ND AND 3RD YEAR SPECIALISATION

OCEAN: HYDRODYNAMICS AND MARINE ENGINEERING

Provide the students with the scientific and technical knowledge in hydrodynamics for ocean engineering to allow them to address societal issues linked mainly to energy (marine renewable energies, offshore oil and gas) 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:

Lionel Gentaz

CENTRALE NANTES LECTURERS:

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

EXTERNAL SPEAKERS:

Academics: ICAM Nantes

Companies: H&T, Principia, D-ICE, Bureau Veritas Solutions, Spinergie, Cadeler, Innosea,...

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EXAMPLES OF PREVIOUS PROJECTS

- > Pre-design and characterization of floating offshore wind farms: LHEEA-Centrale Nantes
- > Aerodynamics and wind propulsion-sensitivity of interactions: Bureau Veritas Solutions
- > Numerical study of the aerodynamic performance of a vertical axis wind turbine: LHEEA-Centrale Nantes
- > Structural study of a class 40 sailboat in bio-sourced material: David Raison Ingénierie Navale
- > Study of innovative mooring systems for floating wind turbines: Innosea
- > Study of a fishing boat with sailing assistance: H&T
- > Comparison and verification of a turbine model on OrcaFlex and OpenFast software: Innosea

EXAMPLES OF PREVIOUS INTERNSHIPS

- > Aero-elastic calculations with hydrodynamic coupling on offshore wind turbine: Bureau Veritas, France
- > Analysis of data at sea with study of the fatigue of an mooring line: University of Exeter, England
- > Modeling of wave spectra: DHI, Denmark
- > Offshore installation study: Innosea, Scotland
- > Optimization of the design of the foundation of a floating wind turbine: EDF-EN, France
- > Experimental optimization of the control of a wind thruster for merchant ships: CRAIN, France
- > Participation in ship studies: stability, structure, pre-project: H&T, France
- > Marine operations and logistics: TOWT (TransOceanic Wind Transport), France

