Ocean engineering (OE) offers programs leading to the master of science and doctor of philosophy degree in ocean engineering. Programs in OE are by definition interdisciplinary and require students to interact with the ocean science community, as well as the traditional engineering disciplines. Students are exposed to the broad-based issues of working engineering problems in the ocean environment, as well as discipline specifics. In these programs they will be trained to develop responsible solutions to problems that will lead to sustainable activity and life in the ocean.

A master of science in ocean engineering with an option in ocean mapping is available. This is a more structured path through the program, which is approved by the International Hydrographic Organization (IHO) and incorporates all aspects of hydrography as required by the IHO. Focus is on the engineering aspects of hydrography. The general purpose of these programs is to prepare engineering students for professional careers in ocean-related fields.

Additionally, a graduate certificate in ocean mapping is offered.

### Admission Requirements

Applicants should have completed a baccalaureate degree in either chemical, civil, electrical, or mechanical engineering, or have an equivalent background.

https://ceps.unh.edu/ocean-engineering/academics

### Programs

- Ocean Engineering (Ph.D.) (http://catalog.unh.edu/graduate/programs-study/ocean-engineering/ocean-engineering-phd)
- Ocean Engineering (M.S.) (http://catalog.unh.edu/graduate/programs-study/ocean-engineering/ocean-engineering-ms)
- Ocean Engineering: Ocean Mapping (M.S.) (http://catalog.unh.edu/graduate/programs-study/ocean-engineering/ocean-engineering-mapping-ms)
- Ocean Mapping (Graduate Certificate) (http://catalog.unh.edu/graduate/programs-study/ocean-engineering/ocean-mapping-certificate)

### Courses

**Ocean Engineering (OE)**

OE 810 - Ocean Measurements Laboratory  
Credits: 4  
Measurements of fundamental ocean processes and parameters. Emphasis on understanding typical offshore measurements, their applications, and the use of the acquired data. The latter is in terms of the effects on structures and processes in the ocean.

OE 853 - Ocean Hydrodynamics  
Credits: 3  
Fundamental concepts of fluid mechanics as applied to the ocean; continuity; Euler and Navier-Stokes equations; Bernoulli equation; stream function, potential function; momentum theorem; turbulence and boundary layers are developed with ocean applications. Prereq: MATH 527; CIE 642 or ME 608.

OE 854 - Ocean Waves and Tides  
Credits: 4  
Small amplitude, linear wave theory, standing and propagating waves, wave energy, refraction, diffraction, transformation in shallow water, statistics of random seas, spectral energy density, generating wave time series using the random phase methods forces on structures, Froude scaling of wave tank experiments, nonlinear effects. Description of tides as long waves, equilibrium tide, mathematical modeling including friction, nonlinear effects, and Coriolis forces, tidal analysis, the Great Bay Estuarine System as a case study. Prereq: General Physics I, Differential Equations, and Multi-Dimensional Calculus.  
Equivalent(s): EOS 854

OE #856 - Principles of Naval Architecture and Model Testing  
Credits: 4  
Fundamentals of naval architecture presented including hydrostatics, basics of resistance and propulsion, sea keeping and scaling. Concepts applied in experiments utilizing the tow/wave tank and associated instrumentation. Prereq: fluid dynamics, mechanics III, or equivalent. Lab.  
Equivalent(s): CIE 857, ME 857

OE 857 - Coastal Engineering and Processes  
Credits: 3  
Introduction to small-amplitude and finite-amplitude wave theories. Wave forecasting by significant wave method and wave spectrum method. Coastal processes and shoreline protection. Wave forces and wave structure interaction. Introduction to mathematical and physical modeling. Prereq: fluid dynamics or permission. (Also offered as CIE 857 and ME 857.)  
Equivalent(s): CIE 857, ME 857

OE 858 - Design of Ocean Structures  
Credits: 3  
The foundational information necessary for the design of ocean structures. Topics include floating body, fixed body and moored line hydrostatics; wave forces on small and large bodies; dynamic response of floating bodies; and pile and gravity foundation geotechnics. Prereq: Mechanics of Materials; Fluid Mechanics; Dynamics; Differential Equations, Waves & Tides, or permission.

OE 864 - Spectral Analysis of Geophysical Time Series Data  
Credits: 4  
This course considers basic exploratory techniques and in-depth spectral analysis for estimation with geophysical time series data, including calculations of confidence intervals and significance testing. This course prepares students for interpreting time series data with science and engineering applications. Topics include sampling theory, filtering, statistics, probability, spectral analysis, and empirical orthogonal functions. Students gain experience in code-writing for the analysis of time series data. Students enrolled at the 800 level provide data for analysis. Prereq: MATH 426.  
Equivalent(s): ESCI 864
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<th>Course Title</th>
<th>Credits</th>
<th>Repeat Rule</th>
<th>Equivalent(s)</th>
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<td>Geodesy and Positioning for Ocean Mapping</td>
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Faculty

See https://ceps.unh.edu/ocean-engineering/faculty-staff-directory for faculty.