OE 400 - Ocean Engineering Seminar
Credits: 1
A seminar based course considering contemporary topics involved in ocean exploration. Faculty and guest speakers will describe thematic ocean engineering subareas through weekly presentations. The presentations will provide examples of engineering applications and ocean exploration. Class participation credit can be earned through oral discussions, presentation of contemporary OE topics, or hands on projects.
Repeat Rule: May be repeated for a maximum of 2 credits.

OE 401 - Ocean Engineering Seminar
Credits: 1
A seminar based course considering contemporary topics involved in ocean exploration. Faculty and guest speakers will describe thematic ocean engineering subareas through weekly presentations. The presentations will provide examples of engineering applications and ocean exploration. Class participation credit can be earned through oral discussions, presentation of contemporary OE topics, or hands on projects.
Repeat Rule: May be repeated for a maximum of 2 credits.

OE 490 - Introduction to Ocean Engineering
Credits: 4
Survey of engineering applications in the ocean environment. Topics vary an include hydrodynamics, waves, tides, underwater sound, instrumentation, marine geomechanics, and naval architecture. Includes guest lectures by faculty members from the Engineering departments. Prereq: PHYS 407.

OE 521 - Power of the Sea: Scientific Discovery in the Ocean
Credits: 4
This course considers the struggle to understand the physics of the sea to help predict when the sea will unleash its fury. The scientific discovery of ocean engineering topics such as tides, waves, and tsunamis are introduced through their human historical introduction. The historical significance and preliminary resolution of each physical mechanism provide context for the fundamental formulations and contemporary predictive models. The course also considers the role of ocean disasters and geopolitical conflict in motivating scientific exploration of the oceans.
Attributes: Physical Science(Discovery)

OE 610 - Ocean Instrumentation Lab
Credits: 4
An investigation of the discrete and integrated electronics typically used in the design and implementation of ocean instruments. Topics include both passive and active analog electronic elements typically used for signal conditioning of common oceanographic sensors (e.g., thermostors, pressure sensors, acoustic transducers); A/D and D/A conversion, sensor sampling criteria and rules, with examples from contemporary ocean instruments; embedded micro-controller/microcomputer modules for autonomous or remote sensing in ocean environments; inter-instrument communications methods typically used in ocean instruments (e.g., serial and network communications). Laboratory time will be used to develop practical experience in specification, design, development and testing of various ocean instrument components based on the material presented. Prereq: MATH 527; MATH 528; ECE 537; IAM 550.
OE 764 - 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. Prereq: MATH 426.
Equivalent(s): ESCI 764

OE 765 - Underwater Acoustics
Credits: 3
An introduction to acoustics in the ocean. Fundamental acoustic concepts including the simple harmonic oscillator, waves on strings, and the acoustic wave equation; the sonar equation; sound generation and reception by underwater acoustic transducers and arrays; basics of sound propagation; reflection and scattering from ocean boundaries. Spring semester offered every year; satisfies core course requirement in Ocean Engineering. Prereq: PHYS 407/408, MATH 527 or equivalent.

OE 771 - Geodesy and Positioning for Ocean Mapping
Credits: 4
The science and technology of acquiring, managing, and displaying geographically-referenced information; the size and shape of the earth, datums and projections; determination of precise positioning of points on the earth and the sea, including classical terrestrial-based methods and satellite-based methods; shoreline mapping, nautical charting and electronic charts. Prereq: MATH 426, PHYS 408. (Also listed as ESCI 771.)
Equivalent(s): ESCI 771

OE 774 - Integrated Seabed Mapping Systems
Credits: 4
Overview of typical applications that involve mapping the sediment-water interface in the ocean and adjacent waters. Emphasis on defining the task-specific resolution and accuracy requirements. Fundamentals of acoustics relevant to seabed mapping. Progression through typical configurations involving single beam, sidescan, phase differing and multibeam systems. Integration of asynchronous 3D position, orientation and sound speed measurements with sonar-relative acoustic travel time and angles. Analysis of impact of offsets, mis-alignments and latency in all integrated sensors.

OE 795 - Special Topics
Credits: 2-4
New or specialized courses and/or independent study. May be repeated for credit.

OE #797 - Honors Seminar
Credits: 1
Course enrichment and/or additional independent study in subject matter pertaining to 600- or 700-level OE courses.
Attributes: Honors course
Repeat Rule: May be repeated for a maximum of 3 credits.