OCEN - Ocean Engineering

Courses

OCEN 201 Introduction to Ocean Engineering
Credits 3. 3 Lecture Hours.
Survey of ocean engineering; concepts and theories of wave-structure interaction; sources of technical information; coastal and ocean structures, moorings, laboratory models; underwater systems; naval architecture; ocean instrumentation; materials and corrosion; hydrographic surveying and positioning, recent developments in ocean engineering.
Prerequisite: CVEN 221 or registration therein.

OCEN 300 Ocean Engineering Wave Mechanics
Credits 3. 3 Lecture Hours.
Physical and mathematical fundamentals of ocean wave behavior; mechanics of wave motion; use of statistics and probability to develop design wave criteria.
Prerequisite: CVEN 311, OCEN 201 or registration therein.

OCEN 336 Fluid Dynamics Laboratory
Credit 1. 2 Lab Hours.
Introduction to laboratory techniques, calibration principles, reports and fluid measurements; determination of fluid properties; visualization of types of flow; experiments in closed conduit flow of air, water and oil; fluid drag and turbomachinery tests; open channel and gravity wave demonstrations.
Prerequisite: CVEN 311 or registration therein.

OCEN 362 Hydromechanics
Credits 3. 3 Lecture Hours.
Kinematics of fluids; differential analysis of fluid flow; incompressible, irrotational and turbulent flow; Navier-Stokes equations; flow of viscous fluids; open-channel flow.
Prerequisites: CVEN 311; MATH 308; junior or senior classification.

OCEN 400 Basic Coastal Engineering
Credits 3. 3 Lecture Hours.
Mechanics of wave motion; wave refraction, diffraction and reflection; wave forecasting; shore processes; planning of coastal engineering projects; design of seawalls, breakwaters, beach nourishment, and fixed and floating installations; dredging; risk analysis.
Prerequisites: OCEN 300 or approval of instructor; CVEN 311; junior or senior classification.

OCEN 401 Underwater Acoustics for Ocean Engineers
Credits 3. 3 Lecture Hours.
Fundamentals of underwater acoustics, SONAR equations, propagation of underwater sound, acoustic transducers and arrays, noise in the ocean environment, design and prediction of SONAR systems, ocean engineering applications of underwater sound.
Prerequisite: CVEN 311.

OCEN 402 Principles of Naval Architecture
Credits 3. 3 Lecture Hours.
Elementary principles of naval architecture; ship geometry and hydrostatics; load line and classification regulations; concept of intact and damaged stability; resistance and propulsion of water-borne vehicles; applications to the design consideration of semi-submersibles, catamarans and drilling rigs.
Prerequisite: CVEN 311.

OCEN 403 Dynamics of Offshore Structures
Credits 3. 3 Lecture Hours.
Prediction of loads due to wind, current and waves; introduction to concepts of linear structural dynamics and to the design of ocean structures; mooring and towing analysis; fluid-structure interactions; vibration of submerged structures; offshore pipelines; introduction to risk analysis.
Prerequisites: OCEN 300 or approval of instructor; CVEN 345, CVEN 363 or registration therein.

OCEN 407 Design of Ocean Engineering Facilities
Credits 4. 1 Lecture Hour. 6 Lab Hours.
Design of structures, equipment and systems for the ocean; environmental, logistical and reliability requirements; complete design process followed through group design project; delineation of alternatives, constraints, economics and environmental consequences included to strengthen real-life problem solving skills.
Prerequisites: OCEN 400, OCEN 402, OCEN 403 or approval of instructor.

OCEN 408 Underwater and Moored System Design
Credits 3. 3 Lecture Hours.
Basic principles of thermodynamics, fluid dynamics and human respiration physiology applied to design of underwater habitats, submersibles and diving bells; breathing gas supply for diving systems; heat transfer for underwater systems; pressure vessel design; remotely operated vehicles; subsea flowlines and manifold systems; and design of towed and moored systems.
Prerequisites: CVEN 311; MEEN 315 or approval of instructor.

OCEN 410 Ocean Engineering Laboratory
Credit 1. 3 Lab Hours.
Fundamental techniques and instrumentation for field and laboratory measurements pertaining to ocean engineering experiment planning; data analysis and data presentation; written reports describing planning, analysis and results of experiments.
Prerequisites: OCEN 400, OCEN 402, OCEN 403; junior or senior classification.

OCEN 475 Environmental Fluid Mechanics
Credits 3. 3 Lecture Hours.
Examines fluid and mass transport in naturally occurring flows; topics include molecular and turbulent diffusion; dispersion; river, estuary, and ocean mixing; dissolution boundary layers; tidal mixing; offshore wastewater outfalls; introduction to environmental quality numerical modeling.
Prerequisite: CVEN 311.

OCEN 481 Seminar
Credit 1. 1 Lecture Hour.
Responsibilities and obligations of new ocean engineers; professional ethics, membership in professional societies and professional registrations; case studies and lectures presented by staff and practicing engineers. Must be taken on a satisfactory/unsatisfactory basis.
Prerequisite: OCEN 300.

OCEN 485 Directed Studies
Credits 1 to 6. 1 to 6 Other Hours.
Special problems in various areas of ocean engineering assigned to individual students or to groups; readings and assignments given and frequent consultations held.
Prerequisite: Approval of program head.
OCEN 489 Special Topics in...
Credits 1 to 4. 1 to 4 Lecture Hours.
Selected topics in an identified field of ocean engineering. May be repeated for credit.
Prerequisite: Approval of instructor.

OCEN 491 Research
Credits 1 to 4. 1 to 4 Other Hours.
Research conducted under the direction of faculty member in ocean engineering. May be repeated 2 times for credit. Registration in multiple sections of this course is possible within a given semester provided that the per semester credit hour limit is not exceeded.
Prerequisites: Junior or senior classification and approval of instructor.