

COASTAL AND OCEANOGRAPHIC ENGINEERING

Program Information

The coastal and oceanographic engineering program is offered through the Department of Civil and Coastal Engineering with the following degrees: Master of Engineering, Master of Science, and Doctor of Philosophy degree. Subject to approval by the supervisory committee, graduate-level courses taken through the College of Engineering (EGN), the Departments of Environmental Engineering Sciences, Geological Sciences, and Mechanical and Aerospace Engineering are considered as major credit.

For courses taken through the Department of Civil and Coastal Engineering, credit hours graded S/U will not count toward graduation except for

- 6 hours of CGN 6971 Research for Master's Thesis (1-15 cr.) or EOC 6971 Research for Master's Thesis (1-15 cr.) for thesis students
- 3 hours of CGN 6974 Master of Engineering or Engineer Degree Report (1-6 cr.) for students working on the M.E. report
- CGN 7979 Advanced Research (1-12 cr.) or EOC 7979 Advanced Research (1-12 cr.)
- CGN 7980 Research for Doctoral Dissertation (1-15 cr.) or EOC 7980 Research for Doctoral Dissertation (1-15 cr.)

The department offers a combination bachelor's/master's degree program for current UF undergraduate students who intend to complete a graduate degree at UF. Please contact the undergraduate coordinator for information.

Degrees Offered

Degrees Offered with a Major in Coastal and Oceanographic Engineering

- Doctor of Philosophy
- Master of Engineering
- Master of Science

Requirements for these degrees are given in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

Courses

Coastal and Oceanographic Engineering Courses

| Code | Title | Credits |
|----------|--|---------|
| EGM 5816 | Intermediate Fluid Dynamics | 3 |
| EOC 5860 | Port and Harbor Engineering | 3 |
| EOC 6196 | Littoral Processes | 3 |
| EOC 6430 | Coastal Structures | 3 |
| EOC 6850 | Numerical Simulation Techniques in Coastal and Ocean Engineering | 3 |
| EOC 6905 | Individual Study in Coastal and Oceanographic Engineering | 1-4 |

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| EOC 6934 | Advanced Topics in Coastal and Oceanographic Engineering | 1-6 |
| EOC 6939 | Graduate Seminar | 1 |
| EOC 6971 | Research for Master's Thesis | 1-15 |
| EOC 7979 | Advanced Research | 1-12 |
| EOC 7980 | Research for Doctoral Dissertation | 1-15 |
| OCP 6050 | Physical Oceanography | 3 |
| OCP 6165 | Ocean Waves I: Linear Theory | 3 |
| OCP 6167 | Ocean Waves II: Nonlinear Theory | 3 |
| OCP 6168 | Data Analysis Techniques for Coastal and Ocean Engineers | 3 |
| OCP 6295 | | 3 |
| OCP 6298 | Coastal Sediment Transport Processes | 3 |

Civil and Coastal Engineering Departmental Courses

| Code | Title | Credits |
|-----------|---|---------|
| CCE 5035 | Construction Planning and Scheduling | 3 |
| CCE 6016 | Advanced Engineering Cost Estimating | 3 |
| CCE 6037 | Civil Engineering Operations I | 3 |
| CCE 6515C | Engineering and Construction Analytics using BIM | 3 |
| CEG 5105 | Geotechnical Engineer | 3 |
| CEG 5114 | Advanced Geotechnical Aspects of Landfill Design | 3 |
| CEG 5115 | Foundation Design | 3 |
| CEG 5205C | Insitu Measurement of Soil Properties | 3 |
| CEG 5805 | Ground Modification Design | 2 |
| CEG 6015 | Advanced Soil Mechanics | 3 |
| CEG 6116 | Advanced Shallow Foundation Design | 3 |
| CEG 6117 | Advanced Deep Foundation Design | 3 |
| CEG 6206 | Nondestructive Testing and Geophysical Methods | 3 |
| CEG 6405 | Seepage in Soils | 3 |
| CEG 6515 | Earth Retaining Systems and Slope Stability | 3 |
| CES 5010 | Probabilistic and Stochastic Methods in Civil Engineering | 3 |
| CES 5116 | Finite Elements in Civil Engineering | 3 |
| CES 5325 | Design of Highway Bridges | 3 |
| CES 5607 | Behavior of Steel Structures | 3 |
| CES 5715 | Prestressed Concrete | 3 |
| CES 5801 | Design and Construction in Timber | 3 |
| CES 6106 | Advanced Structural Analysis | 3 |
| CES 6108 | Structural Dynamics | 3 |
| CES 6117 | Advanced Finite Element Analysis in Civil Engineering | 3 |
| CES 6164C | Structural Health Monitoring | 3 |
| CES 6165 | Concrete Structural Rehabilitation | 3 |
| CES 6585 | Wind Engineering | 3 |
| CES 6588 | Protective Structures | 3 |
| CES 6590 | Impact Engineering | 3 |
| CES 6591 | Applied Protective Structures | 3 |
| CES 6592 | Retrofit Protective Structures | 3 |
| CES 6593 | Advanced Protective Structures | 3 |
| CES 6706 | Advanced Reinforced Concrete | 3 |
| CGN 5605 | Public Works Planning | 3 |
| CGN 5606 | Public Works Management | 3 |
| CGN 6425 | Applied Data Science in Civil and Environmental Engineering | 3 |
| CGN 6504 | Concrete Durability | 3 |
| CGN 6505 | Properties, Design and Control of Concrete | 3 |

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| CGN 6506 | Bituminous Materials | 3 |
| CGN 6525 | Sustainable Materials | 3 |
| CGN 6877C | Nondestructive Evaluation of Civil Infrastructure | 3 |
| CGN 6905 | Special Problems in Civil Engineering | 1-6 |
| CGN 6910 | Supervised Research | 1-5 |
| CGN 6936 | Civil Engineering Graduate Seminar | 1 |
| CGN 6940 | Supervised Teaching | 1-5 |
| CGN 6971 | Research for Master's Thesis | 1-15 |
| CGN 6974 | Master of Engineering or Engineer Degree Report | 1-6 |
| CGN 7979 | Advanced Research | 1-12 |
| CGN 7980 | Research for Doctoral Dissertation | 1-15 |
| CWR 5125 | Groundwater Flow I | 3 |
| CWR 5127 | Evaluation of Groundwater Quality | 3 |
| CWR 5235 | Open Channel Hydraulics | 3 |
| CWR 6116 | Advanced Surface Hydrology | 3 |
| CWR 6240 | Mixing and Transport in Turbulent Flow | 3 |
| CWR 6537 | Contaminant Subsurface Hydrology | 3 |
| EGM 5816 | Intermediate Fluid Dynamics | 3 |
| EGN 5949 | Practicum/Internship/Cooperative Work Experience | 1-6 |
| EGN 6640 | Entrepreneurship for Engineers | 3 |
| EGN 6913 | Engineering Graduate Research | 0-3 |
| EOC 5860 | Port and Harbor Engineering | 3 |
| EOC 6085 | Field Methods for Coastal Engineers | 3 |
| EOC 6116 | Nearshore Coastal Processes | 3 |
| EOC 6196 | Littoral Processes | 3 |
| EOC 6430 | Coastal Structures | 3 |
| EOC 6850 | Numerical Simulation Techniques in Coastal and Ocean Engineering | 3 |
| EOC 6905 | Individual Study in Coastal and Oceanographic Engineering | 1-4 |
| EOC 6934 | Advanced Topics in Coastal and Oceanographic Engineering | 1-6 |
| EOC 6939 | Graduate Seminar | 1 |
| EOC 6971 | Research for Master's Thesis | 1-15 |
| EOC 7979 | Advanced Research | 1-12 |
| EOC 7980 | Research for Doctoral Dissertation | 1-15 |
| OCP 6050 | Physical Oceanography | 3 |
| OCP 6165 | Ocean Waves I: Linear Theory | 3 |
| OCP 6167 | Ocean Waves II: Nonlinear Theory | 3 |
| OCP 6168 | Data Analysis Techniques for Coastal and Ocean Engineers | 3 |
| OCP 6298 | Coastal Sediment Transport Processes | 3 |
| OCP 6605 | Estuarine Circulation | 3 |
| TTE 5006 | Advanced Urban Transportation Planning | 3 |
| TTE 5256 | Traffic Engineering | 3 |
| TTE 5305 | Advanced Transportation Systems Analysis | 3 |
| TTE 5805 | Geometric Design of Transportation Facilities | 3 |
| TTE 5837 | Pavement Management Systems | 3 |
| TTE 6008 | Fundamentals of the Transportation Profession | 3 |
| TTE 6205 | Freeway Operations and Simulation | 3 |
| TTE 6207 | Advanced Highway Capacity Analysis | 3 |
| TTE 6259 | Urban Streets Simulation and Control | 3 |
| TTE 6267 | Traffic Flow Theory | 3 |
| TTE 6275 | Connected & Automated Vehicles | 3 |
| TTE 6306 | Computational Methods in Transportation Engineering | 3 |
| TTE 6315 | Highway Safety Analysis | 3 |
| TTE 6505 | Discrete Choice Analysis | 3 |

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| TTE 6605 | Smart Multimodal Transportation Systems | 3 |
| TTE 6606 | Urban Transportation Models | 3 |
| TTE 6615 | Electric, Shared, and Micro Mobility | 3 |

College of Engineering Courses

| Code | Title | Credits |
|-----------|--|---------|
| EEE 5354L | Semiconductor Device Fabrication Laboratory | 3 |
| EEE 5776 | Applied Machine Learning | 3 |
| EEE 6778 | Applied Machine Learning II | 3 |
| EGN 5215 | Machine Learning Applications in Civil Engineering | 3 |
| EGN 5216 | Machine Learning for Artificial Intelligence Systems | 3 |
| EGN 5442 | Programming for Applied Data Science | 3 |
| EGN 6216 | Artificial Intelligence Systems | 3 |
| EGN 6217 | Applied Deep Learning | 3 |
| EGN 6446 | Mathematical Foundations for Applied Data Science | 3 |
| EGN 6640 | Entrepreneurship for Engineers | 3 |
| EGN 6642 | Engineering Innovation | 3 |
| EGN 6913 | Engineering Graduate Research | 0-3 |
| EGN 6933 | Special Topics | 1-3 |
| EGN 6937 | Engineering Fellowship Preparation | 0-1 |
| EGS 6012 | Research Methods in Engineering Education | 3 |
| EGS 6020 | Research Design in Engineering Education | 3 |
| EGS 6039 | Engineering Leadership | 3 |
| EGS 6050 | Foundations in Engineering Education | 3 |
| EGS 6051 | Instructional Design in Engineering Education | 3 |
| EGS 6054 | Cognition, Learning, and Pedagogy in Engineering Education | 3 |
| EGS 6056 | Learning and Teaching in Engineering | 1 |
| EGS 6085 | Advanced Engineering Educational Technology | 3 |
| EGS 6101 | Divergent Thinking | 3 |
| EGS 6626 | Fundamentals of Engineering Project Management | 3 |
| EGS 6628 | Advanced Practices in Engineering Project Management | 3 |
| EGS 6629 | Agile Project Management for Engineers and Scientists | 3 |
| EGS 6681 | Advanced Engineering Leadership | 3 |
| EGS 6930 | Engineering Education Seminar | 1 |
| EGS 6940 | Preparation for Engineering Education Practicum | 1 |
| EGS 6949 | Research to Practice Experience in Engineering Education | 1-3 |
| EGS 6971 | Research for Master's Thesis | 1-12 |
| EGS 7979 | Advanced Research | 1-12 |
| EGS 7980 | Research for Doctoral Dissertation | 1-12 |
| ESI 6900 | Principles of Engineering Practice | 1-4 |

Student Learning Outcomes

Coastal & Oceanographic Engineering (phd)

SLO 1 Knowledge

An ability to critically read engineering literature in Coastal and Oceanographic Engineering and an ability to identify, formulate new

solutions to engineering problems in Coastal and Oceanographic Engineering.

SLO 2 Skills

An ability to develop new techniques, skills, and modern engineering tools necessary for engineering practice at an advanced level in Coastal and Oceanographic Engineering.

SLO 3 Professional Behavior

Effectively communicate technical knowledge and information.

Coastal & Oceanographic Engineering (ME & MS)

SLO 1 Knowledge

An ability to identify, formulate and solve engineering problems in Coastal and Oceanographic Engineering

SLO 2 Skills

An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice at an advanced level in Coastal and Oceanographic Engineering

SLO 3 Professional Behavior

Effectively communicate technical knowledge and information