Coastal Engineering & Sciences (CEAS) Program
Increasing coastal populations, rising sea levels, and the potential for more intense storms making landfall call for an increased understanding and expertise in coastal science in Louisiana and around the world. In response to this present and growing need, Greater New Orleans, Inc. (GNO, Inc.) worked with the University of New Orleans (UNO) to create the Coastal Engineering and Sciences (CEAS) Program.

Industry outreach conducted by GNO, Inc., illustrated a need for a workforce with unique coastal knowledge and identified opportunities for current employees within those firms to achieve this specialized expertise. Through one-on-one meetings and a structured survey, GNO, Inc. was able to inform the best structure and curriculum to cover in the courses. GNO, Inc. is committed to a continued partnership with UNO on industry outreach for this program.
Two graduate certificates in Coastal Engineering and Coastal Sciences are offered by UNO’s CEAS Program. Each certificate consists of four courses that can be completed over a two year period. All courses will be available to students in the classroom and working professionals via an online platform. The entire certificate program can be completed online.

The outcome is a highly relevant, specific, and marketable program that will not only make UNO graduates more sought after by the industry, but will utilize UNO’s expertise within the fields of coastal engineering and coastal sciences.
CURRICULUM

Courses will cover subject areas in coastal restoration and nourishment techniques, beach, barrier and deltaic processes and geomorphology, as well as specific aspects and processes governing deltaic soft soils such as those found in the Northern Gulf. Where appropriate, expert guest speakers will be utilized to bring current information from the field into the lectures.

Coastal Processes (EES 5900)
Physical processes in the coastal environment. Key elements of this course include wind waves – their generation and transformation processes, coastal hydrodynamics and transport processes, coastal water level fluctuations (short-term and long-term), and governing processes on beach/barrier, deltaic, wetland and estuarine environments. Introductory concepts in coastal morphodynamics will be presented through case studies on land building, deltaic and estuarine sedimentation, marsh edge erosion, longshore transport and shoreline change, run-up and inundation over wash during storms, and inlet backbarrier interactions. The course will also emphasize modeling tools available for the study of such environments, and review observation techniques and analysis tools already used.

Sediment Transport & Dredging (ENCE6334)
Particle size analysis, fluid-particle systems, incipient motion; suspended and total loads; bedforms; sediment measurements; physical and numerical modeling of sediment transport; transport of liquid-solid mixtures in pipes; dredging equipment; hydraulic and mechanical dredging; geotechnical properties of dredged sediments; environmental impacts of dredging; pipeline transport of dredged sediments.

Ocean & Coastal Engineering (ENCE 5723)
Elements of wind and wave generation and forecasting, tidal phenomena, hurricanes, storm surge, tsunamis, interaction of waves and wind with coastal and offshore structures, coastal and estuary processes. Design aspects of various topics are discussed and analyzed: e.g., offshore structures, coastal protection, beach formation, harbor resonance, littoral transport and control. A design project is required.

Required courses for the Graduate Coastal Engineering Certificate (CEC)

Required courses for the Graduate Coastal Science Certificate (CSC)
STRUCTURE
- Certificate courses are not structured in a progression; they can be taken in any order
- At least one course for both certificates will be offered every semester (excluding summer)
- Completion of certificates can be achieved in two years or less depending on the frequency of courses offered
- Average GPA of 3.0 is necessary to obtain a certificate
- No GRE is required for the certificate program

Design of Coastal & Hydraulic Structures (ENCE 6329)
Design of hydraulic structures including consideration of types and functions of dams; hydraulic design of spillways, crest gates, outlets works, and stilling basins; design considerations for hydraulic machinery, hydroelectric power, canals, and navigation locks. Geotechnical consideration and design of floodwalls; stability, seepage, and settlement of levees; rubblemound breakwaters; armor layer stability; bulkhead design and stability; shore protection alternatives; design of pumping stations, sector gates, outfall structures; Hurricane and Storm Damage Risk Reduction; construction considerations and life-cycle-cost analysis.

Coastal Restoration & Management (EES 6760)
Coastal problems and appropriate mitigation approaches on barrier shorelines and beaches, deltas, and estuaries. Management aspects include project implementation and a background to regulatory frameworks for coastal restoration decision-making.

Coastal Geomorphology (EES 5550)
Process relationships in a variety of coastal settings, including beaches and barrier shorelines, estuaries, and tidal wetlands, rocky coasts and cliffs, coral reefs and atolls. Fundamental driving processes in a coastal environment such as climate, waves, tides and storms will be discussed through case studies. Field measurements of coastal parameters will also be discussed.
ADMISSIONS

Working professionals earning a certificate online will be enrolled as non-degree seeking students. For those who wish to pursue a master’s degree at UNO, credits earned through these certificate programs can be applied toward that degree.

Graduate Coastal Engineering Certificate – Academic Requirements:
- Undergraduate degree from an accredited university in engineering or oceanographic sciences is preferred
- Experienced professionals will also be considered upon consent of department

Degree Requirements for Coastal Science Certificate:
- Undergraduate degree from an accredited university in earth, oceanographic, or marine sciences is preferred, but not required
- Experienced professionals will also be considered upon consent of department

FEES
- $1,364* per 3-credit course
- $5,456* per certificate (4 courses x $1,364)
*Spring 2016 cost

The University of New Orleans (UNO) is a major research university in one of the world’s most fascinating cities. For more than 50 years, it has been one of the city’s foremost public resources, offering a diverse set of world-class, research-based programs, advancing shared knowledge and adding to the city’s industry, culture and economy. Since 1958, UNO has educated students from all 64 Louisiana parishes, all 50 states in the United States and more than 100 countries. Today UNO offers more than 40 undergraduate and pre-professional programs and more than 40 graduate programs.
FACULTY
All the course instructors are currently involved in research activities related to deltaic and beach/barrier restoration projects. The knowledge gained from these real-world research projects is integrated in the course curriculum.

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