OCNG - OCEANOGRAPHY (OCNG)

OCNG 101 Succeeding in Oceanography
Credit 1. 1 Lecture Hour. Introduction to the study of the ocean and to the departmental and university resources available to assist and enhance the pursuit of a degree in oceanography or ocean studies; variety of guest lecturers will present on career pathways, internship, and research opportunities.

OCNG 203 Communicating Oceanography
Credit 1. 2 Lab Hours. Learn and practice basic writing skills for ocean science; basic background on the research being conducted in the Department of Oceanography through seminars given by Oceanography graduate students. Prerequisites: OCNG 251; majors in oceanography.

OCNG 251 The Blue Planet - Our Oceans
Credits 3. 3 Lecture Hours. (GEOL 1345, GEOL 1445*) The Blue Planet - Our Oceans. Overview of the ocean environment; interrelation of the subdisciplines of ocean sciences; importance of the oceans to human beings; human impact on the oceans; also taught at Galveston campus.

OCNG 252 The Blue Planet - Our Oceans Laboratory
Credit 1. 2 Lab Hours. (GEOL 1145, GEOL 1445*) The Blue Planet - Our Oceans Laboratory. Hands-on laboratory experiments and exercises demonstrating principles of ocean sciences; emphasis on the unique interdisciplinary nature of the ocean and current ocean issues relevant to today's society; also taught at Galveston campus.

OCNG 281 Seminar
Credit 1. 1 Other Hour. Basic background on the research being conducted in the Department of Oceanography through seminars given by Oceanography graduate student; basic writing skills for ocean science through instruction and assignments during the semester. Prerequisites: OCNG 251; OCNG 252; or approval of instructor.

OCNG 291 Research
Credits 0 to 4. 0 to 4 Other Hours. Research conducted under the direction of faculty member in oceanography. 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: Freshman or sophomore classification and approval of instructor.

OCNG 303 Professional Communication in Oceanography
Credits 3. 3 Lecture Hours. Exploration of the fundamental skills required for effective communication of various forms of writing and for oral presentations of various lengths and purposes; addresses preparation for various ocean science-related careers. Prerequisite: OCNG 203; COMM 203 or COMM 205, junior or senior classification or approval of instructor.

OCNG 310 Physical Oceanography
Credits 3. 3 Lecture Hours. Elements of the physics of the sea; descriptive aspects as well as cause and effect relations in respect to currents, thermal structure and waves. Intended for majors in the physical sciences or engineering. Prerequisites: MATH 152; junior or senior classification.

OCNG 320 Biological Oceanography
Credits 3. 2 Lecture Hours. Biological aspects of the marine environment; marine organisms; productivity of the sea; marine pollution and fouling; use of the sea. Prerequisites: OCNG 251, BIOL 112 or BIOL 107; junior or senior classification or approval of instructor.

OCNG 330 Geological Oceanography
Credits 3. 3 Lecture Hours. History of Oceanography; physiographic provinces of the oceans, their origins and sediments; geological sampling techniques and geophysical methods; coasts and beaches, paleoceanography; global tectonics. Prerequisites: OCNG 251, GEOL 101 or GEOG 203, or approval of instructor.

OCNG 340 Chemical Oceanography
Credits 3. 3 Lecture Hours. Chemical aspects of the marine environment; biogeochemical cycles of organic and inorganic constituents; primary productivity, the carbon dioxide system, nutrient cycles, stable and radioactive isotopes in the sea. Prerequisites: CHEM 120 and OCNG 251.

OCNG 350 Marine Pollution
Credits 3. 3 Lecture Hours. Sources and fates of marine pollutants; types of pollutants including plastics, oil and sound; impact of pollution on society. Prerequisite: Junior or senior classification or approval of instructor.

OCNG 404 Ocean Observing Systems
Credits 3. 3 Lecture Hours. Investigate the rationale behind ocean observing systems; familiarize with the relevant social, scientific design, technology and policy issues associated with observing systems. Prerequisite: OCNG 251 or approval of instructor.

OCNG 411 Global Oceanography
Credits 3. 3 Lecture Hours. The ocean's large-scale circulation and water mass structure based on the interpretation of modern observations; emphasis on the ocean's role in global climate and physical-chemical property fluxes in basin to global scale budgets. Prerequisite: OCNG 251.

OCNG 413 Polar Regions of the Earth: Science, Society and Discovery
Credits 3. 3 Lecture Hours. Overview of disciplines and topics that define modern polar science in the north and the south; includes history of the Polar Regions, polar geosciences, major polar scientific projects, and special topics; participate as individuals and teams in education, outreach and science projects. Prerequisite: Junior or senior classification.

OCNG 425 Microbial Oceanography
Credits 3. 3 Lecture Hours. Diversity and ecology of microorganisms in the ocean; role in the Earth system both in the contemporary ocean and the geological past. Prerequisites: Junior or senior classification, OCNG 251, or approval of instructor.
OCNG 443 Oceanographic Field and Laboratory Methods  
Credits 3. 2 Lecture Hours. 2 Lab Hours. Development of skills needed to collect, prepare and analyze oceanographic samples; perform data analysis, interpretation and reporting for common oceanographic analyses. **Prerequisite:** OCNG 251 and CHEM 120; junior or senior classification or approval of instructor.

OCNG 451 Mathematical Modeling of Ocean Climate  
Credits 4. 3 Lecture Hours. 2 Lab Hours. Problem-based course in theoretical and computer techniques applied to mathematical solutions of ocean climate, including ocean circulation, climate variability, El Niño. **Prerequisite:** MATH 308.

OCNG 453 Hydrothermal Vents and Mid-Ocean Ridges  
Credits 3. 3 Lecture Hours. Exploration of the creation of various types of hydrothermal fluids, the associated chemical behavior of vent and plume fluids, and the ecology of hydrothermal vent systems; emphasis on the interdependence of the geological, chemical, and biological aspects of hydrothermal systems. **Prerequisite:** OCNG 251; BIOL 112; CHEM 120; junior or senior classification or approval of instructor.

OCNG 456 MATLAB Programming for Ocean Sciences  
Credits 3. 2 Lecture Hours. 2 Lab Hours. Computation techniques for oceanographic data processing using MATLAB; focus on the analysis of oceanographic-related data sets and real-world oceanographic applications; analyze individual data sets. **Prerequisite:** Junior or senior classification or approval of the instructor.

OCNG 461 Advanced Oceanographic Data Analysis and Communication  
Credits 3. 3 Lecture Hours. Project design and planning for oceanographers; oceanographic data organization and analysis; synthesis and interpretation of data analysis; technical report writing and presentation. **Prerequisite:** OCNG 203; OCNG 310; OCNG 456 or 469; OCNG 470; or approval of instructor.

OCNG 469 Python for Geosciences  
Credits 3. 3 Lecture Hours. 1 Lab Hour. Core language Python programming, scientific programming analysis methods, analysis of large geophysical data sets, plotting geophysical data, interpolation. **Prerequisite:** Junior or senior classification.

OCNG 470 Data Analysis Methods in Geosciences  
Credits 4. 3 Lecture Hours. 2 Lab Hours. Topics and methods encountered while performing research in the geosciences; conceptualization of a scientific problem, data collection and processing, appropriate analysis techniques and data archiving and management; multi-disciplinary approach with an emphasis on real-world applications from environmental, atmospheric, and oceanographic sciences. **Prerequisite:** Junior or senior classification; MATH 151; STAT 211, STAT 301, STAT 302, or STAT 303, or concurrent enrollment; or approval of instructor.

OCNG 481 Seminar  
Credit 1. 1 Lecture Hour. Analysis, review and critique of current research themes in oceanography based on reading assignments and seminar presentations. May be taken four times for credit. **Prerequisite:** Junior or senior classification.

OCNG 484 Internship  
Credits 0 to 3. 0 Lecture Hours. 0 to 3 Other Hours. Directed internship in a private firm, government agency or non-governmental organization to provide work experience related to the student's degree program and career objectives. Must be taken on a satisfactory/unsatisfactory basis. **Prerequisite:** OCNG major or approval of instructor.

OCNG 485 Directed Studies  
Credits 1 to 4. 1 to 4 Other Hours. Special reading assignments, problems and discussion on oceanographic topics of mutual interest to student and instructor. **Prerequisites:** OCNG 251 or approval of instructor. An honors section is also available.

OCNG 489 Special Topics in...  
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours. Selected topics in an identified area of oceanography. May be taken two times for credit. **Prerequisite:** OCNG 251 or approval of instructor. An honors section is also available.

OCNG 491 Research  
Credits 0 to 9. 0 to 9 Other Hours. Research conducted under the direction of faculty member in oceanography. Registration in multiple sections of this course is possible within a given semester provided that the per semester credit hour limit is not exceeded. Honors section also available. Must be taken on a satisfactory/unsatisfactory basis. **Prerequisites:** Junior or senior classification and approval of instructor.