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

Credits 3. 3 Lecture 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 OCNG and OCNS.

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.

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 289 Special Topics in...

Credits 1 to 4. 1 to 4 Other Hours. Selected topics in an identified area of oceanography. May be repeated for credit. **Prerequisites:** 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 4. 3 Lecture Hours. 2 Lab 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; PHYS 206; PHYS 226, PHYS 216/ENGR 216, or ENGR 216/PHYS 216; junior or senior classification.

OCNG 320 Biological Oceanography

Credits 4. 3 Lecture Hours. 2 Lab 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, BIOL 107, or ECCB 205; junior or senior classification or approval of instructor.

OCNG 330 Geological Oceanography

Credits 4. 3 Lecture Hours. 2 Lab 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 4. 3 Lecture Hours. 2 Lab Hours. A basic understanding of the chemistry of the ocean and the chemical fluxes with the atmosphere, continents and seafloor; special emphasis will be placed on the application of chemical concepts and measurements to the other oceanographic disciplines. **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 355 The Blue Frontier - Harnessing Ocean Resources for Future Sustainability

Credits 3. 3 Lecture Hours. Survey of Blue Economy industries and practices and examination of sustainable and equitable use and management of ocean resources. **Prerequisites:** OCNG 251; junior or senior classification.

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 412/GEOG 410 Global Change

Credits 3. 3 Lecture Hours. The interaction of the earth, atmosphere, oceans, cryosphere and life, including the impact of human society on the environment and climate; global change modeling; politics, policy and decision making; and personal awareness. **Prerequisite:** Junior or senior classification. **Cross Listing:** GEOG 410/OCNG 412.

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. **Prerequisites:** OCNG 203; STAT 211 or STAT 303; junior or senior classification.

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.