OCNG - OCEANOGRAPHY (OCNG)

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.

OCNG 251 Oceanography
Credits 3. 3 Lecture Hours.
(GEOL 1345, GEOL 1445*) Oceanography. 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 Oceanography Laboratory
Credit 1. 2 Lab Hours.
(GEOL 1145, GEOL 1445*) Oceanography 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. Honors sections and contracts are also available; 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. 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 and junior or senior classification.

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. 2 Lecture Hours. 2 Lab 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 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; GEOS 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 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 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.  
Prerequisites: Junior or senior classification and approval of instructor.