OCNG - OCEANOGRAPHY (OCNG)

OCNG 203 Communicating Oceanography Laboratory
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.

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.

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.

OCNG 281 Seminar
Credit 1 Lecture 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 or OCNG 401; 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 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 401 Interdisciplinary Oceanography
Credits 3.3 Lecture Hours.
Quantitative survey of interdisciplinary relationships between biological, chemical, geological/geophysical and physical aspects of the ocean. Honors section also available.
Prerequisites: MATH 131, MATH 151, or MATH 171; 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 OCNG 401 or approval of instructor.

OCNG 410 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 420 Biological Oceanography
Credits 3.3 Lecture Hours.
Biological aspects of the marine environment; marine organisms; productivity of the sea; marine pollution and fouling; use of the sea.
Prerequisites: BIOL 112 or OCNG 251; 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 OCNG 401, or approval of instructor.

OCNG 430 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 or OCNG 401 or GEOL 101 or GEOL 104 or GEOG 203, junior or senior classification.

OCNG 440 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 102 or CHEM 104; junior or senior classification; sophomore with 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: MATH 152, CHEM 102, 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 or MATH 451.
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 or OCNG 401, 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 281, OCNG 404, OCNG 410, and GEOS 470, or
approval of the 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 OCNG 401 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 OCNG 401 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.
Prerequisites: Junior or senior classification and approval of instructor.
An honors section is also available.