Studies in Oceanography

Oceanography is an interdisciplinary science that focuses on the oceans, their contents and their boundaries. Degree programs include BS in Oceanography, MS (thesis option) in Oceanography, PhD in Oceanography and a Master of Ocean Science and Technology (MOST) a non-thesis professional degree. In addition, qualified undergraduate students may participate in a 15-credit minor in Oceanography.

The BS in Oceanography provides students with an interdisciplinary education and training in one of three areas of ocean science: Ocean Observing Systems and Technology (OOST), Ocean Climate (OC) and Marine Ecosystem Science and Health (MESH). All students will gain skill in handling, evaluating and analyzing large datasets.

The Department of Oceanography also has Fast Track 5 year Bachelor’s/MOST Programs in conjunction with Environmental Geosciences, Atmospheric Sciences and Geology. These Fast Track Programs offer motivated and exceptional students the opportunity to achieve aspirations in an efficient program at Texas A&M, completing a Bachelor’s degree in one of these majors: Environmental Geosciences (B.S.), Meteorology (B.S.), Geology (B.S. or B.A.) and the Master of Ocean Science and Technology degree in 5 years. There are only two courses used for dual credit in this program. There is a total of 150 hours of coursework. The concurrent degree program enables these motivated students to coordinate the required B.S coursework (114 undergraduate credit hours plus 6 dual credit graduate courses) and MOST coursework (36 credit hours including the 6 dual credit graduate courses) to complete the required credit hours for each degree without diminishing scope or quality of work within 5 years.

Faculty

Baldauf, Jack G, Professor
Oceanography
PHD, University of California, Berkeley, 1985

Brooks, David A, Professor
Oceanography
PHD, University of Miami, 1975

Campbell, Lisa, Professor
Oceanography
PHD, State University of New York at Stony Brook, 1985

Chang, Ping, Professor
Oceanography
PHD, Princeton University, 1988

Chapman, Piers, Professor
Oceanography
PHD, University of Wales, UK, 1983

Dimarco, Steven F, Professor
Oceanography
PHD, The University of Texas at Dallas, 1991

Fitzsimmons, Jessica N, Assistant Professor
Oceanography
PHD, Massachusetts Institute of Technology, 2013

Gardner, Wilford D, Professor
Oceanography
PHD, Massachusetts Institute of Technology, 1978

Giese, Benjamin S, Professor
Oceanography
PHD, University of Washington, 1989

Gold Bouchot, Gerardo, Professor
Oceanography
PHD, CINVESTAV Merida, 1991

Hetland, Robert D, Professor
Oceanography
PHD, Florida State University, 1999

Knap, Anthony H, Professor
Oceanography
PHD, University of South Hampton, 1978

Orsi, Alejandro H, Professor
Oceanography
PHD, Texas A&M University, 1993

Potter, Henry, Visiting Assistant Professor
Oceanography
PHD, University of Miami, 2014

Richardson, Mary J, Professor
Oceanography
PHD, Massachusetts Institute of Technology, 1980

Shamberger, Kathryn E, Assistant Professor
Oceanography
PHD, University of Washington, 2011

Slowey, Niall C, Professor
Oceanography
PHD, Massachusetts Institute of Technology, 1991

Stoessel, Achim, Associate Professor
Oceanography
PHD, Universitat Hamburg, 1990

Sylvan, Jason B, Assistant Professor
Oceanography
PHD, Rutgers, The State University of New Jersey, 2008

Thomas, Deborah J, Professor
Oceanography
PHD, University of North Carolina at Chapel Hill, 2002

Thornton, Daniel C, Associate Professor
Oceanography
PHD, Queen Mary Westfield College, University of London, 1996

Thyng, Kristen M, Research Assistant Professor
Oceanography
PHD, University of Washington, 2012
Wiederwohl, Christina L, Instructional Assistant Professor
Oceanography
PHD, Texas A&M University, 2012

Yvon-Lewis, Shari A, Professor
Oceanography
PHD, University of Miami, 1994

Zhang, Yige, Assistant Professor
Oceanography
PHD, Yale University, 2015

**Majors**
- Bachelor of Science in Oceanography (http://catalog.tamu.edu/undergraduate/geosciences/oceanography/bs)

**Minors**
- Oceanography Minor (http://catalog.tamu.edu/undergraduate/geosciences/oceanography/minor)

**Courses**

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. 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. Honors section also available.  
**Prerequisites:** Junior or senior classification and approval of instructor.