

MARINE SCIENCE (MSCI)

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MSCI Courses

MSCI 100. Orientation to Marine Sciences. 1 unit

Term Typically Offered: F

CR/NC

Prerequisite: Marine Sciences major.

Introduction to Marine Sciences faculty, the Biology Department and campus resources, research opportunities, possible careers, studying science, and current topics in marine sciences. Credit/No credit grading only. 1 lecture.

MSCI 111. Survey of Marine Biology. 4 units

Term Typically Offered: W

2020-21 or later catalog: GE Area B2

2019-20 or earlier catalog: GE Area B2

Sustainability Focused

Marine organisms and their adaptations to the ocean. Focus on select marine ecosystems including coastal ecosystems. Interaction between humans and the sea. Topics include effects of ocean acidification and pollution, climate change, and loss of marine biodiversity. Not open for major credit in Biological Sciences, Marine Sciences, or Microbiology. 4 lectures. Fulfills GE Area B2.

MSCI 300. Marine Ecology. 4 units

Term Typically Offered: F, W

Prerequisite: BIO 160, BIO 162, and BIO 263. Recommended: STAT 218.

Introduction to the functional biology of marine plants and animals and the ecological processes that underlie their distribution and abundance in open oceans, coastal regions, and estuaries. Field trips required. 2 lectures, 2 laboratories. Formerly MSCI 328.

MSCI 301. Biological Oceanography. 3 units

Term Typically Offered: F

Prerequisite: BIO 160; BIO 161; BIO 263; CHEM 129; MSCI 300; PSC 201; and STAT 218.

Interdisciplinary study of marine organisms, how they interact with each other and their physical, chemical and geological environment. Emphasis on how these interactions impact abundance, diversity and temporal and spatial distributions. 3 lectures.

MSCI 324. Marine Mammals, Birds and Reptiles. 4 units

Term Typically Offered: W

Prerequisite: BIO 162; BIO 263; and STAT 218.

Introduction to the biology, ecology and evolution of mammals, reptiles and birds of the marine environment, with an emphasis on Central California species, diversity patterns, evolutionary relationships, adaptations to the ocean, and conservation issues. Field trips required. 2 lectures, 2 laboratories.

MSCI 330. Technologies for Ocean Discovery. 4 units

Term Typically Offered: SP

2020-21 or later: Upper-Div GE Area B

2019-20 or earlier catalog: GE Area B5, B6, or B7

Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; and completion of GE Areas B1 through B4, with a grade of C- or better in one course in GE Area B4 (GE Area B1 for students on the 2019-20 or earlier catalogs). Recommended: Introductory statistics course.

Survey of ocean sensor systems and emerging technologies that provide new understanding of the ocean. Current issues in marine science. Social context, societal implications of discoveries in ocean sciences. Field trip required. Not open for major credit in Biological Sciences, Marine Sciences or Microbiology. Not open to students with credit in MSCI 403. 3 lectures, 1 activity. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

MSCI 401. Marine Science Outreach. 1-2 units

Term Typically Offered: F, W, SP

CR/NC

Prerequisite: MSCI 300 or MSCI 301 or PSC 201; Junior standing and consent of instructor.

Volunteer or internship experience in a marine science business, industry, government agency or informal science center. Positions require communicating science to the public. Formal report and evaluation by work supervisor required. Major credit limited to 4 units. Total credit limited to 8 units. Credit/No credit grading only.

MSCI 403. Ocean Sampling Techniques. 4 units

Term Typically Offered: F

Prerequisite: CHEM 302; MSCI 301; PSC 201; and STAT 218.

Introduction to techniques in oceanography and marine sciences. Hands-on technical training in sampling, measuring, tagging and tracking of bathymetry and geography; waves, tides and currents; salinity, temperature and pressure; dissolved oxygen and pH; irradiance and light scattering; phytoplankton and zooplankton; and benthic fauna and marine macrofauna. 2 lectures, 2 laboratories. Formerly MSCI 303.

MSCI 410. Scientific Diving. 3 units

Term Typically Offered: SU

Prerequisite: BIO 263, open water diving certificate, and instructor consent. Recommended: MSCI 300 or MSCI 301.

Advanced training in scientific methods associated with practical training in scuba diving. Satisfies American Academy of Underwater Sciences standards. Combination of theory, techniques and scuba diving. Experience collecting data and handling scientific equipment underwater. AAUS certification will require additional assessments outside of class. Field trips and additional fee required. 1 lecture, 2 labs.

MSCI 428. Marine Conservation and Policy. 4 units

Term Typically Offered: W

Sustainability Focused

Prerequisite: BIO 160 and BIO 263; and BIO 327 or BIO 363 or BIO 401 or BOT 326 or MSCI 300; or Graduate standing in Biological Sciences.

Recommended: PSC 201.

Examination of how science and policy are used to evaluate and implement marine conservation and resource management. Topics include endangered species, fisheries, climate change, marine protected areas, research and conservation topics and developing policy for management decision-making. Field trip required. 3 lectures, 1 laboratory.

MSCI 437. Marine Botany. 4 units

Term Typically Offered: W

Prerequisite: Junior standing and BIO 162.

Comprehensive examination of the ecology, life histories, functional morphology, physiology, and taxonomy of marine algae and marine plants. Laboratory emphasizes species endemic to the central coast of California. Course offered in hybrid format with classroom-based and online learning. 3 lectures, 1 laboratory.

MSCI 438. Aquaculture. 4 units

Term Typically Offered: F

Prerequisite: BIO 160, BIO 162, and BIO 263.

Propagation and rearing of fishes, invertebrates and algae from marine, freshwater, and estuarine habitats. Current methodologies and general life histories. Global perspective including aquacultural development in developed and developing countries. 3 lectures, 1 laboratory.

MSCI 439. Fisheries Science and Resource Management. 4 units

Term Typically Offered: SP

Sustainability Focused

Prerequisite: BIO 162 and MSCI 300. Recommended: BIO 322.

Scientific investigation of marine and freshwater fisheries. Methodologies and quantitative strategies for study of finfish and invertebrates. Role of oceanographic or limnological processes on stock maintenance. Impact of human exploitation on maintenance of sustainable yields, including user-group conflict issues, and regional/global controversies. Lab/field protocols, basic fisheries statistical procedures, molecular methods, computer simulations. Field trip required. 3 lectures, 1 laboratory.

MSCI 440. Communicating Ocean Sciences to Informal Audiences. 3 units

Term Typically Offered: F

Prerequisite: Junior standing; BIO 322, BIO 336, MSCI 300, or PSC 201; completion of GE Area A with grades of C- or better; and GE Area B2 or BIO 211.

Simultaneous focus on developing a knowledge of ocean sciences and the advanced educational approaches for communicating that knowledge. Teaching skills developed through coursework, outreach events and design of collaborative projects at museums and aquariums. Primary objective is to learn how to present ocean-themed hands-on, inquiry-based science exhibits, in order to improve the scientific literacy of audiences of all ages. Field trip required. 1 lecture, 2 activities.