

# GEOL M05: THE WORLD OCEAN

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**Originator**

rputnam

**College**

Moorpark College

**Discipline (CB01A)**

GEOL - Geology

**Course Number (CB01B)**

M05

**Course Title (CB02)**

The World Ocean

**Banner/Short Title**

The World Ocean

**Credit Type**

Credit

**Start Term**

Fall 2022

**Catalog Course Description**

Introduces the field of oceanography including a study of the features of the ocean floor, how ocean basins are made and destroyed, the chemical and physical aspects of seawater, ocean-atmosphere interactions, ocean circulation, waves, tides, and beaches with emphasis on the Southern California marine environment. Studies interactions between human society, marine life, and the ocean.

**Taxonomy of Programs (TOP) Code (CB03)**

1914.00 - Geology

**Course Credit Status (CB04)**

D (Credit - Degree Applicable)

**Course Transfer Status (CB05) (select one only)**

A (Transferable to both UC and CSU)

**Course Basic Skills Status (CB08)**

N - The Course is Not a Basic Skills Course

**SAM Priority Code (CB09)**

E - Non-Occupational

**Course Cooperative Work Experience Education Status (CB10)**

N - Is Not Part of a Cooperative Work Experience Education Program

**Course Classification Status (CB11)**

Y - Credit Course

**Educational Assistance Class Instruction (Approved Special Class) (CB13)**

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

May be required

**Faculty notes on field trips; include possible destinations or other pertinent information**

Field trips to locations on the Ventura County Coast such as Silverstrand Beach, Ventura harbor, Mugu Rock, and Ventura Point

**Grading method**

(L) Letter Graded

**Alternate grading methods**

(O) Student Option- Letter/Pass

(P) Pass/No Pass Grading

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Minimum Contact/In-Class Lecture Hours**

52.5

**Maximum Contact/In-Class Lecture Hours**

52.5

**Activity**

**Laboratory**

**Total in-Class**

**Total in-Class**

**Total Minimum Contact/In-Class Hours**

52.5

**Total Maximum Contact/In-Class Hours**

52.5

**Outside-of-Class**

**Internship/Cooperative Work Experience**

Paid

Unpaid

**Total Outside-of-Class**

**Total Outside-of-Class**

**Minimum Outside-of-Class Hours**

105

**Maximum Outside-of-Class Hours**

105

**Total Student Learning**

**Total Student Learning**

**Total Minimum Student Learning Hours**

157.5

**Total Maximum Student Learning Hours**

157.5

**Minimum Units (CB07)**

3

**Maximum Units (CB06)**

3

**Student Learning Outcomes (CSLOs)**

**Upon satisfactory completion of the course, students will be able to:**

- 1 describe the tectonic, sedimentary, climatological, and celestial processes that affect ocean depth at a given location or time.
- 2 explain how and why the climate crisis is an "ocean crisis".

**Course Objectives**

**Upon satisfactory completion of the course, students will be able to:**

- 1 describe and give examples of the interactions between the four basic components of Earth as a global ecosystem - the atmosphere, hydrosphere, lithosphere, and biosphere.
- 2 apply the scientific method to solve oceanographic problems such as the origin of ocean basins, causes of El Niño , and models of ocean circulation.
- 3 explain the theory of plate tectonics by describing the three types of plate boundaries and the physical features and processes that occur at each type with reference to appropriate examples.
- 4 relate plate tectonic processes to phenomena such as tsunamis, origin of ocean basins, oceanic volcanoes, islands and other seafloor features.
- 5 describe the different types of marine sediments (i.e., hydrogenous, cosmogenous, biogenous, and lithogenous), their distribution, and use as natural resources.
- 6 identify the major chemical constituents of seawater and sources of salts in the ocean; explain the processes that control temperature, salinity, and density variations in the ocean; and explain how the physical properties of water contribute to the ocean's ability to moderate climate and sustain life.
- 7 summarize the hydrologic cycle and identify major water reservoirs and components related to oceanographic processes.
- 8 analyze and explain the relationship that exists between solar energy and global patterns of wind and atmospheric pressure; explain the concept of air masses and fronts and their role in the development of weather disturbances such as storms and tornadoes.
- 9 describe or diagram atmosphere-ocean interactions and how they cause ocean surface currents, waves, as well as phenomena such as hurricanes, El Nino, monsoons, and sea and land breezes.

- 10 describe the characteristics, formation, and dynamics of wind-driven waves.
- 11 describe tidal phenomena and relate them to the motions of the Earth, Sun, and Moon.
- 12 identify coastal landforms and explain the processes of erosion and deposition responsible for beaches, barrier islands, rocky shorelines, and other coastal habitats.
- 13 list and describe several types of ocean pollutants that affect the water quality of coastal zones.
- 14 contrast biological productivity in polar, tropical, and temperate regions and explain how limiting factors cause differences in the marine environment.
- 15 discuss the characteristics of several marine pelagic and benthic ecosystems, the niches that organisms occupy in the food web, and how organisms adapt to conditions within those environments.

## Course Content

### Lecture/Course Content

- 5% - History of oceanography
- 13% - Pelagic and benthic ecosystems
- 6% - Biological productivity
- 7% - Marine life and the environment
- 13% - The coastal ocean: beaches and shoreline processes
- 6% - Tides
- 6% - Waves and water dynamics
- 13% - Atmosphere-ocean interaction and ocean circulation
- 12% - Chemical and physical properties of water and seawater
- 6% - Marine sediments
- 6% - Seafloor features and marine provinces
- 7% - Plate tectonics and the ocean floor

### Laboratory or Activity Content

n/a

## Methods of Evaluation

**Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):**

Written expression  
Skills demonstrations

**Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):**

Essay exams  
Individual projects  
Journals  
Objective exams  
Quizzes  
Research papers  
Skills demonstrations  
Other (specify)  
Classroom Discussion  
Projects  
Participation  
Reports/Papers/Journals

### Other

describe the interactions of organisms within marine ecosystems via a poster and/or oral presentation.  
write a report based on research on an oceanographic topic.

## Instructional Methodology

**Specify the methods of instruction that may be employed in this course**

Audio-visual presentations

Case studies  
 Class activities  
 Class discussions  
 Collaborative group work  
 Distance Education  
 Field trips  
 Lecture  
 Readings  
 Small group activities

**Describe specific examples of the methods the instructor will use:**

- Demonstrate principles of ocean shape and bathymetry in Google Earth.
- In class demonstrations of thermohaline circulation
- Organized debates on controversial topics related to oceanography (e.g., oceanic conservation versus natural resource depletion) in which students must defend a particular perspective.
- Think-pair-share exercises on questions related to oceanography
- Explore bathymetry in Google Earth.

**Representative Course Assignments**

**Writing Assignments**

- Write position papers on controversial subjects in ocean conservation.
- Present results of a marine research project in the form of a report, visual poster, and/or oral presentation.

**Critical Thinking Assignments**

- Research the concept of air masses and fronts and their roles in the development of oceanic weather patterns.
- Analyze the relationship between solar energy and global patterns of wind and atmospheric pressure.
- Assess the tectonic causes of bathymetric features around the world using Google Earth.

**Reading Assignments**

- Read professional journal articles on the subject of oceanography.
- Read articles from newspaper, journal articles, and/or Internet sources about current events in ocean public policy.

**Skills Demonstrations**

- Locate oceanographic features and places on a map or in Google Earth.
- Predict temperature, salinity, and density characteristics of seawater at a given location.
- Evaluate ocean sediment type in a given location based on depth and proximity to continental sediment sources.

**Outside Assignments**

**Representative Outside Assignments**

- Participate in optional field trip(s) to various local sites (e.g., beach, aquarium).
- Conduct library database and web-based research on oceanographic topics such as the use of modern instrumentation and ocean resource management.
- Journaling exercises on current events occurring in/about the ocean using newspaper, journal articles, and/or Internet sources.

**Articulation**

**Equivalent Courses at 4 year institutions**

University	Course ID	Course Title	Units
CSU Northridge	GEOL 122	The World Ocean	3
Cal Poly Pomona	GSC 1200	Introduction to Oceanography	3
UC Santa Barbara	EARTH 4	Introduction to Oceanography	4
UC Riverside	GEO 9	Oceanography	4

**Comparable Courses within the VCCCD**

GEOL R103 - Introduction to Oceanography  
 GEOL V11 - Introduction to Oceanography

MST R103 - Introduction to Oceanography

## **District General Education**

### **A. Natural Sciences**

#### **A2. Physical Science**

Approved

### **B. Social and Behavioral Sciences**

### **C. Humanities**

### **D. Language and Rationality**

### **E. Health and Physical Education/Kinesiology**

### **F. Ethnic Studies/Gender Studies**

Course is CSU transferable

Yes

CSU Baccalaureate List effective term:

F1995

## **CSU GE-Breadth**

**Area A: English Language Communication and Critical Thinking**

**Area B: Scientific Inquiry and Quantitative Reasoning**

**Area C: Arts and Humanities**

**Area D: Social Sciences**

**Area E: Lifelong Learning and Self-Development**

**Area F: Ethnic Studies**

**CSU Graduation Requirement in U.S. History, Constitution and American Ideals:**

## **UC TCA**

UC TCA

Approved

**IGETC**

**Area 1: English Communication**

**Area 2A: Mathematical Concepts & Quantitative Reasoning**

**Area 3: Arts and Humanities**

**Area 4: Social and Behavioral Sciences**

**Area 5: Physical and Biological Sciences**

**Area 5A: Physical Science**

Approved

**Area 6: Languages Other than English (LOTE)**

**Textbooks and Lab Manuals**

**Resource Type**

Textbook

**Description**

Sverdrup, Keith, and Raphael Kudela. *Investigating Oceanography*. 3rd ed., McGraw-Hill, 2019.

**Resource Type**

Textbook

**Description**

Trujillo, Alan P, and Harold V. Thurman. *Essentials of Oceanography*. 13th ed., Prentice Hall, 2019.

**Resource Type**

Textbook

**Description**

Garrison, Tom and Robert Ellis. *Oceanography: An Invitation to Marine Science*. 10th ed., Cengage, 2021.

**Library Resources**

**Assignments requiring library resources**

Research, using the Library’s print and online resources, on specific topics involving ocean resource management.

**Sufficient Library Resources exist**

Yes

**Example of Assignments Requiring Library Resources**

- Write position papers on controversial subjects in ocean conservation.
- Present results of a marine research project in the form of a report, visual poster, and/or oral presentation.

**Distance Education Addendum**

**Definitions**

**Distance Education Modalities**

- Hybrid (1%–50% online)
- Hybrid (51%–99% online)
- 100% online

## Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

## Regular Effective/Substantive Contact

### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/ discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes. E.g. - Students will use the discussion board in Canvas to discuss how the geosphere and hydrosphere influence each other.
E-mail	Email, class announcements and tools such as “Message Students Who” and “Assignment Comments” in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: o Recorded Lectures, Narrated Slides, Screencasts o Instructor created content o MC Online Library Resources o Canvas Peer Review Tool o Canvas Student Groups (Assignments, Discussions) o 3rd Party (Publisher) Tools (Mastering Geography) o Websites and Blogs o Multimedia (YouTube, Films on Demand, 3CMedia, Google Earth, Earth.nullschool, etc.)
Synchronous Dialog (e.g., online chat)	Scheduled synchronous sessions may be organized at the instructor’s discretion to demonstrate skills, address problems, and review asynchronous lectures. Synchronous sessions may also be used for students to work on problem sets together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.

### Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/ discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes. E.g. - Students will use the discussion board in Canvas to discuss how the geosphere and hydrosphere influence each other.



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Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> <li>o Recorded Lectures, Narrated Slides, Screencasts</li> <li>o Instructor created content</li> <li>o MC Online Library Resources</li> <li>o Canvas Peer Review Tool</li> <li>o Canvas Student Groups (Assignments, Discussions)</li> <li>o 3rd Party (Publisher) Tools (Mastering Geography)</li> <li>o Websites and Blogs</li> <li>o Multimedia (YouTube, Films on Demand, 3CMedia, Google Earth, Earth.nullschool, etc.)</li> </ul>
Synchronous Dialog (e.g., online chat)	Scheduled synchronous sessions may be organized at the instructor’s discretion to demonstrate skills, address problems, and review asynchronous lectures. Synchronous sessions may also be used for students to work on problem sets together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.
<b>100% online Modality:</b>	
<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes. E.g. - Students will use the discussion board in Canvas to discuss how the geosphere and hydrosphere influence each other.
E-mail	Email, class announcements and tools such as “Message Students Who” and “Assignment Comments” in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.
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## Examinations

### Hybrid (1%–50% online) Modality

On campus  
Online

### Hybrid (51%–99% online) Modality

On campus  
Online

## Primary Minimum Qualification

EARTH SCIENCE

## Review and Approval Dates

### Department Chair

11/02/2021

### Dean

11/02/2021

### Technical Review

11/18/2021

### Curriculum Committee

12/07/2021

### DTRW-I

MM/DD/YYYY

### Curriculum Committee

MM/DD/YYYY

### Board

MM/DD/YYYY

### CCCCO

MM/DD/YYYY

### Control Number

CCC000431630

### DOE/accreditation approval date

MM/DD/YYYY