



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

LAST REVIEW: 2010-11

NEXT REVIEW: 2015-2016

STATUS: A

COURSE TITLE: Introductory Oceanography Laboratory

COMMON COURSE NUMBER: OCE-1001L

CREDIT HOURS: 1

CONTACT HOUR BREAKDOWN

CLOCK HOURS:

Lecture:

Lab: 32

Clinic:

Other:

PREREQUISITE(S): MAT0024 with grade of “C” or better.

COREQUISITE(S):

PRE/COREQUISITE(S): OCE-1001

COURSE DESCRIPTION: Laboratory methods for the Ocean Sciences. The topics covered will include problem solving in all aspects of ocean science to understand how the hydrosphere, lithosphere, biosphere and atmosphere of our planet functions and interacts and demonstrate a basic understanding of the unifying principles and processes that link geology, chemistry, physics, meteorology and biology to the study of the world ocean.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s):

Area 4C

General Education Requirements – Associate in Science Degree (AS), meets Area(s):

Area 4 or 5

General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s):

Area 4 or 5

UNIT TITLES

1. Latitude, Longitude, Bathymetry, Time, and Navigation
2. Geological Oceanography
3. Physical Oceanography
4. Chemical Oceanography
5. Biological Oceanography



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GENERAL EDUCATION Competencies and Skills *:

In the box to the right of the Competency/Skill, enter all specific **student learning outcome** unit numbers, as indicated in the course outline (i.e. 1.1, 2.7, 4.2, 4.0 and 5.12) that apply.

Course must include <u>all</u> of the following:	
1. Read with critical comprehension**	all outcomes
2. Write clearly and coherently**	1.0 – 5.0
3. Demonstrate literacy as appropriate within a given discipline**	a) 1.0 – 5.0 e) 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.2, 5.3, 5.5, 5.6 f) 1.0 – 5.0 g) 1.1, 1.4, 2.2, 2.6, 3.1, 3.4, 3.5, 3.7, 4.1, 4.4, 4.5, 5.5
4. Apply problem solving skills or methods to make informed decisions in a variety of contexts**	all outcomes
Course must include at least <u>one</u> of the following:	
5. Differentiate between ethical and unethical behavior	
6. Demonstrate an understanding of the physical, biological, and social environments and how individual behaviors impact this complex system.	2.6, 3.4, 3.7, 4.1, 4.4, 4.5, 5.5
7. Demonstrate an understanding of and appreciation for human diversities and commonalities.	
8. Speak and listen effectively.	

**General Education Competencies and Skills endorsed by 2010-2011 General Education Task Force*

**Required Competencies

1) Read with critical comprehension.

The student will be introduced to the basic texts, concepts, vocabulary, and methods necessary for developing an understanding of the discipline and meeting the required benchmarks as stated in the course outline.

2) Write clearly and coherently.

The student will demonstrate an understanding and mastery of subject matter in a variety of ways, including writing. Writing activities may include both graded and ungraded essays, short answer quizzes, summaries, reactions, journals, and various other reports.

3) Demonstrate and apply literacy across all the disciplines (indicate which ones apply).

- a) **Information literacy** means understanding how to locate needed information, using the appropriate technology for the task, managing and evaluating the extracted information and using it effectively and ethically.
- b) **Technology literacy** is the ability to responsibly and effectively use appropriate technology to access, manage, integrate, or create information, and/or use technology to accomplish a given task.
- c) **Workplace literacy** is having the appropriate knowledge and skills to communicate and work with others effectively and perform job duties, whether it is through the use of computers and/or other technology.
- d) **Cultural literacy** is recognizing, understanding, and appreciating the similarities and differences between one’s own culture and the cultures of others through a study of the arts, customs, beliefs, values, and history that define a culture.
- e) **Quantitative literacy** is having the ability to formulate, solve and interpret mathematical/statistical operations and graphical/tabular representations to make informed decisions.
- f) **Scientific literacy** means understanding the methodology and application of the scientific process, the physical and biological worlds, and recognizing that scientific knowledge is continuously updated or revised as new information is discovered.



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g) Environmental literacy is creating a context within which environmental issues can be viewed, imparting knowledge to enhance one's ability to analyze the issues, make the connections between humans' decisions and actions and the challenges facing the environment, and instilling the desire to sustain the environment through ethical practices in both one's professional and personal lives.

4. Apply problem-solving skills or methods to make informed decisions in a variety of contexts.

The student will use acquired skills or methods to recognize, analyze, adapt, and apply critical thinking to solve problems and make informed decisions.



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EVALUATION:

In the box to the right of the Methods of Assessment, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 4.0, 4.2 and 5.12) that apply.

1. Portfolio	
2. Short essays	
3. Research Papers	
4. Group projects	
5. Discussions (In class and online)	all outcomes
6. Multiple Choice tests	1.1-1.4, 2.1-2.6, 3.1-3.7, 4.1-4.6, 5.1-5.5
7. Presentations	
8. Service Learning Projects	
9. Quizzes (pop, announced, etc.)	
10. Take-home tests	
11. Summaries, critiques, and analyses	all outcomes
12. Reaction papers	
13. Surveys	
14. Performance	all outcomes
15. Short answer tests	1.1-1.4, 2.1-2.6, 3.1-3.7, 4.1-4.6, 5.1-5.5
16. Classroom debates and colloquia	
17. Blogs, wikis, web pages	
18. Other (Please explain) Lab Reports/Lab Notebooks/Lab worksheets	all outcomes



Common Course Number: OCE-1001L

UNITS

Unit 1 Latitude, Longitude, Bathymetry, Time, and Navigation

General Outcome:

- 1.0 The student shall: develop and use laboratory techniques, critical thinking and course reading assignments to formulate an understanding of how to locate a position on the surface of the Earth using the Cartesian coordinate system and how to interpret marine charts and maps. The student shall also present a neat, orderly and scientifically sound written record of all lab work.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Locate positions on the Earth's land and sea surface and ocean bottom utilizing latitude and longitude.**
- 1.2 Interpret ocean floor physiography, relief, and depths from bathymetric maps and charts.**
- 1.3 Plot basic marine navigational charts**
- 1.4 Become familiar with, and be able to plot on a map(s) the geography of the World Ocean and continents, including the location of seas, bays, major rivers and waterways, estuaries, surface ocean and ocean basin features, major mountain chains, lakes, deserts, rain-forests, polar, temperate, tropical, and equatorial regions, ice-caps and the northern, southern, eastern, and western hemispheres.**



Common Course Number: OCE-1001L

UNITS

Unit 1 Geological oceanography

General Outcome:

- 2.0 The student shall: develop and use laboratory techniques, critical thinking and course reading assignments to formulate an understanding of the geologic principles that have contributed to the formation and evolution of Earth's oceans, ocean basins and continents and demonstrate how Earth's evolution has affected ocean basins, seawater characteristics, atmosphere and climate.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1 Acquire and analyze marine geological data to solve to arrive at meaningful outcomes.**
- 2.2 Acquire and analyze data relating to the theory of Plate Tectonics and sea floor evolution.**
- 2.3 Assess the development of the oceans and ocean basins throughout geologic time.**
- 2.4 Analyze the sediments of the World Ocean.**
- 2.5 Explore the controlling factors on the lithogenous, biogenous, chemical and cosmogenous sediment distribution in the world's oceans, and link to the biologic, chemical, and physical ocean processes that contribute to these factors.**
- 2.6 Explore coastal processes and the effect of human attempts to modify coastlines.**
- 2.7 Present a neat and orderly written record of all lab work. Include charts, graphs, tables, drawings, photos, formulas, mathematical equations, maps, and written scientifically sound narratives when required.**



Common Course Number: 1001L

Unit 2 Physical Oceanography

General Outcome:

- 3.0 The student shall: develop and use laboratory techniques, critical thinking and course reading assignments to arrive at basic understanding of processes that govern the physics of the ocean and atmosphere.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1 Explore water's unique and anomalous physical properties and link to its chemistry.**
- 3.2 Acquire and/or analyze data necessary to assess wave characteristics and parameters.**
- 3.3 Acquire and/or analyze data necessary to assess surface and deep ocean current activity and water masses.**
- 3.4 Asses the role of the global heat balance in relation to atmosphere/ocean interaction.**
- 3.5 Assess the role of tidal forces on the earth.**
- 3.6 Assess the role of density, gravity, Coriolis force, pressure gradient forces and temperature in ocean/atmospheric physics.**
- 3.7 Model physical oceanographic processes to formulate and understanding of marine weather and climate, as well as global climate change.**
- 3.8 Present a neat and orderly written record of all lab work. Include, charts, graphs, tables, drawings, photos, formulas, mathematical equations, maps, and written scientifically sound narratives when required.**



Common Course Number: 1001L

Unit 4 Chemical Oceanography

General Outcome:

- 4.0 The student shall: develop and use laboratory techniques, critical thinking and course reading assignments to arrive at basic understanding of the processes that govern the chemistry of the ocean, through course assigned readings, data collection and analysis.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 4.1 Explore water's unique and anomalous chemical properties and link to its physical properties.**
- 4.2 Demonstrate, through data collection and analyses, the chemical properties of sea-water**
- 4.3 Assess the controls on the composition of seawater including the influence of physical, chemical, geological and biological ocean processes on the concentrations of dissolved constituents in seawater.**
- 4.4 Explore the residence time of dissolved constituents in the ocean.**
- 4.5 Assess the role of global biogeochemical recycling with respect to the ocean.**
- 4.6 Present a neat and orderly written record of all lab work. Include, charts, graphs, tables, drawings, photos, formulas, mathematical equations, maps, and written scientifically sound narratives when required.**



Common Course Number: 1001L

Unit 5 Biological Oceanography

General Outcome:

- 5.0 The student shall: develop and use laboratory techniques, critical thinking and course reading assignments to formulate a basic understanding of the processes that control the distribution and abundance of life in the ocean and to demonstrate the effects of oceanic life processes on the entire planet.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 5.1 Assess and analyze the characteristics of marine lifestyles (planktonic, nektonic, benthic, interstitial), marine communities, and their biota.**
- 5.2 Assess marine environmental zones and list characteristics of each zone.**
- 5.3 Investigate the relationship between productivity, net productivity and respiration.**
- 5.4 Classify marine organisms according to the modified Linnean system of classification.**
- 5.5 Explore the physical factors that control the distribution of marine life.**
- 5.6 Present a neat and orderly written record of all lab work. Include, charts, graphs, tables, drawings, photos, formulas, mathematical equations, maps, and written scientifically sound narratives when required.**