GROSSMONT COLLEGE

 COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 03/22/2022

GCCCD Governing Board Approval: 04/19/2022

OCEANOGRAPHY 113 – OCEANOGRAPHY LABORATORY

 1. Course Number Course Title Semester Units

 OCEA 113 Oceanography Laboratory 1

 Semester Hours: 1 hour laboratory 48-54 hours 48-54 total hours

 2. Course Prerequisites

 A “C” grade or higher or “Pass” in OCEA 112 or equivalent or concurrent enrollment.

 Corequisite

 None

 Recommended Preparation

 None

 3. Catalog Description

Provides hands-on oceanographic experience to accompany and augment Oceanography 112. The course will include laboratory and field investigations of the marine environment, emphasizing the geological, chemical, physical, and biological aspects of the ocean. Lab activities may include, but are not limited to, field trips to obtain samples, analysis of data, and visits to oceanographic facilities (such as research institutions and aquariums).

 4. Course Objectives

 The student will:

 a. Develop hypotheses and design and perform experiments to test hypotheses.

 b. Use oceanographic equipment to acquire data in the laboratory and field.

 c. Analyze, interpret, and organize data with respect to physical, chemical, and biological principles.

 d. Inspect marine sediment samples and relate their characteristics to physical, chemical and biological conditions.

 e. Construct contour maps, topographic and bathymetric profiles.

 f. Measure and evaluate various wave patterns and tidal cycles.

 g. Describe and evaluate the relationship between marine organisms and their physical environments.

 h. Synthesize oceanographic data using an appropriate scientific format (i.e. field and laboratory reports).

 i. Calculate various ocean parameters such as velocity and make unit conversions given the appropriate data.

 j. Use field practices that emphasize good communication, planning, health and safety practices

 5. Instructional Facilities

 a. Standard laboratory classroom that accommodates performance of simple dry and wet chemical tests.

 b. Smart-cart.

 c. Selected field study areas.

 d. Access to computers.

 6. Special Materials Required of Student

 a. Notebook appropriate for lab and field use.

 b. Appropriate field attire and transportation when required.

7. Course Content

 a. Navigation: the geographical coordinate system, navigational charts and bathymetric maps.

 b. Geological oceanography: coverage of various sampling methods, sediment analysis, and analysis of littoral cells and beach loss due to rising sea level.

 c. Chemical oceanography: measurement and/or analysis of various parameters including salinity, pH, dissolved oxygen and nutrients.

 d. Physical oceanography: observation and measurement of physical parameters such as temperature, light penetration, wave period, wavelength, and current speed.

 e. Biological oceanography: observation and documentation of various forms of marine life and examine their associated physical environments.

 f. Data analysis and presentation: analysis, interpretation, and presentation of data.

 g. Field trips to local areas of oceanographic interest.

 8. Method of Instruction

 a. Lecture.

 b. Classroom and field demonstrations.

 c. Field observations and discussions.

 d. Group discussions.

 e. Internet demonstration.

 9. Methods of Evaluating Student Performance

 a. Grading of laboratory exercises and field reports.

 b. Topical quizzes.

 c. Essay questions and objective exams or quizzes, including final exam.

 d. Evaluation of field and laboratory notebook.

10. Outside Class Assignments

 a. Required reading and preparation of written lab exercises and/or field reports.

 b. Collecting and analyzing real-time data from the Internet.

11. Representative Texts

 a. Representative Text(s):

 None. This course will rely on instructor-designed lab manual, handouts, and exercises.

 b. Supplementary texts and workbooks:

* 1. Garrison, T., *Oceanography: Invitation to Marine Science.* 9th edition. Cengage Learning, 2016.
	2. Trujillo, A.P., and H.V. Thurman. *Essentials of Oceanography*. 12th edition. Prentice Hall, 2016.

 Addendum: Student Learning Outcomes

 Upon completion of this course, our students will be able to do the following:

1. Utilize the tools of Oceanography to collect data and demonstrate the ability to analyze and interpret that data, including the development and interpretation of graphical representations of bathymetry, waves, tides, salinity, temperature or pressure.
2. Apply the scientific method to comprehend, interpret, analyze and evaluate oceanographic concepts, including but not limited to the relationships between: plate tectonics and sea floor features; tidal patterns and earth-sun-moon positions; ~~of~~ the structure of the water molecule ~~to~~ and the chemical and physical properties of the ocean; and oceanic and atmospheric circulation;
3. Define, analyze, and synthesize oceanographic concepts based on observations made within designated field areas.