

Course Syllabus

MARINE BIOGEOCHEMISTRY

Printed by: lualtam

Program: Oceanographic Engineering

1. Course number and name

OCEG1029 - MARINE BIOGEOCHEMISTRY

2. Credits and contact hours

2 credits and 4 contact hours

3. Instructor's course or coordinator's name

JONATHAN MARCELO CEDEÑO OVIEDO

4. Text book, title, author, and year

- Libes, Susan. Introduction to Marine Biogeochemistry (2nd edition) a. Other supplemental materials
- Pilson, Michael E.Q.. An Introduction to the Chemistry of the Sea (2nd Edition)
- Miller, Charles B.; Patricia A. Wheeler. Biological Oceanography (2nd Edition)
- Bianchi, Thomas S.. Biogeochemistry of Estuaries (1st Edition)
- Ormaza-González, Franklin; Peter John Statham. A comparison of methods for the determination of dissolved and particulate phosphorus in natural waters ()

5. Specific course information

a. Brief description of the content of the course (catalog description)

The chemistry section of this professional training course provides basic knowledge of chemical structure composition, distribution and behavior in its different phases (gaseous, dissolved and particulate) of the oceans in all its regions, particularly the aquamarine-coastal-situ bodies of Ecuador. It determines the conservative and non-conservative compounds/elements; and their processes. It examines the broad oceanic cycles of Carbon, Nitrogen, Phosphorus, Silicon, and Iron.

The Biological section describes the different habitats and spatial distribution of marine ecosystems. It describes and classifies different types of marine organisms. It describes how they interact through food webs and energy flows. It relates organisms with roles in marine biogeochemical processes.

The development of research projects will apply acquired knowledge and learn or strengthen new skills. This project will be relevant in academic and social-environmental terms.

The course will contribute to the development of oceanographic engineers, providing knowledge in an argumentative and assertive way that will be associated to the investigation of a relevant case in the social and environmental aspects.

b. Prerequisites

CLIMATOLOGY AND METEOROLOGY -OCEG1030

GENERAL CHEMISTRY - QUIG1032

c. This course is: Required

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6. Specific goals for the course

a. Specific outcomes of instruction

- Analyze micronutrients and organic material in seawater to understand C, N, P, Si, and Fe cycles and how they interact with chemical and physical processes.
- Understand the origin, formation rates, transport and sedimentation of marine and coastal sediments and how they influence ocean chemistry.
- Recognize the different habitats and types of marine organisms found in them
- Understand marine biogeochemical processes and their relationship with the environment.
- Understand the biological processes of primary productivity and energy transfer in marine food webs.
- Propose, execute, analyze results, suggest, and recommend, a social and environmental problem associated with water chemistry through a research project.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to apply the scientific method to oceanic and marine-coastal processes research.

7. Brief list of topics to be covered

- 1.- Evaluation activities
- 2.- Composition, distribution and spatial-temporal behavior of the main elements and compounds.
- 3.- Composition, distribution and spatial-temporal behavior of the gases in water column.
- 4.- Processes that affect the conservative and non-conservative character of element/compound in water bodies.
- 5.- Micronutrients and organic material in seawater.
- 6.- Marine sediments.