

Course Syllabus

CHEMICAL OCEANOGRAPHY

Printed by: jcedeno

Program: Oceanographic Engineering

1. Course number and name

OCEG1004 - CHEMICAL OCEANOGRAPHY

2. Credits and contact hours

3 credits and 4 contact hours

3. Instructor's course or coordinator's name

JONATHAN MARCELO CEDEÑO OVIEDO

4. Text book, title, author, and year

- Caspers, H. (1967), Riley, J. P. and Skirrow, G.. Chemical Oceanography. Vol. 1 & 2 (1)
a. Other supplemental materials
- Pilson, Michael E. Q.. An Introduction to the Chemistry of the Sea (Hardcover; 2013-01-28)
 - R Chester.. Marine geochemistry ((alk. paper))
 - Bianchi, Thomas S.. Biogeochemistry of estuaries ((cloth : alk. paper))
 - Franklin Isaac Ormaza-González, Peter John Statham. A comparison of methods for the determination of dissolved and particulate phosphorus in natural waters (30)
 - Franklin Isaac Ormaza-González et al.. Can small pelagic fish landings be used as predictors of high-frequency oceanographic fluctuations in the 1–2 El Niño region? (2016)
 - Franklin Isaac Ormaza-González and P. Statham. The occurrence and behaviour of different forms of phosphorus in the waters of four English estuaries (I)
 - Franklin Isaac Ormaza-González and J Cedeño. Coastal El Niño 2017 or Simply: The Carnival Coastal Warming Event? (I)

5. Specific course information

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

It provides and analyzes composition, distribution, spatial and temporal behavior of the chemical structure in its different phases (gaseous, dissolved and particulate) of the oceans in all its regions. In particular, marine-coastal-estuarine waters of Ecuador are considered, providing knowledge in an argumentative and assertive manner. Content will be associated with research of pertinent social and environmental case studies, training students for oceanographic research and engineering.

- b. Prerequisites

GENERAL CHEMISTRY - QUIG1001

DESCRIPTIVE OCEANOGRAPHY - OCEG1001

- c. This course is: Required

6. Specific goals for the course



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a. Specific outcomes of instruction

1.- Know the composition, distribution and spatio-temporal behavior of the main elements and compounds in their different phases (dissolved and particulate) of the oceanic, coastal and estuarine waters for the understanding of the affectation or impact by the physical, chemical and microbiological processes.

2.- Know the composition, distribution and spatio-temporal behavior of the main elements and compounds in their different phases (dissolved and particulate) of the oceanic, coastal and estuarine waters for the understanding of the affectation or impact by the physical, chemical and microbiological processes.

3.- Analyze the processes that affect the conservative and non-conservative character of element / compound in the bodies of oceanic, coastal, estuarine water, associating them with the analysis of physical, chemical and microbiological processes, whether natural and / or anthropogenic.

4.- Analyze micronutrients and organic material in seawater for the understanding of C, N, P, Si, and Fe; and how they interact with microbiological, chemical and physical processes.

5.- Propose a research project to execute, obtaining or acquiring data / information followed by an analysis from which information is obtained to suggest, recommend (create) possible solutions to a social and environmental problem associated with water chemistry (chemical oceanography).

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

- An ability to communicate effectively with a range of audiences in English
- 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.- Course policies.
- 2.- Composition, distribution and spatial-temporal behavior of main elements and compounds.
- 3.- Composition, distribution, spatio-temporal behavior of the gases in the water column to understand how they are affected by the temperature and salinity.
- 4.- Processes that affect the conservative and non-conservative character of element /



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compound in the bodies of oceanic water, coastal, estuarine associating them with the analysis of physical, chemical and microbiological processes of natural and anthropogenic origin.

- 5.- Micronutrients and organic material in seawater.
- 6.- Analytical chemistry (practices) throughout the course.

