Leon H. Charney
School of
Marine
Sciences
UNIVERSITY
OF HAIFA

Geochemical oceanography – 2 credits

Course Number: 224.4011

Lecturers: Prof. Barak Herut, Dr. Guy Sisma-Ventura, Dr. Jacob Silverman

Lecturer's Contact Information: Prof. Barak Herut, email: barak@ocean.org.il; Dr. Guy Sisma-Ventura, email: guy.siv@ocean.org.il; Dr. Jacob Silverman, email: jacobs1@ocean.org.il

Course Type: Lecture/Student seminar/Student presentation

Prerequisites: No

Course Description:

This course focuses on chemical cycles in seawater and marine sediments, and their interactions. It will discuss main concepts of mass balance, sources and sinks, biogeochemical processes, the carbonate system, water-sediment/rock interactions and the use of isotope geochemistry as proxies for biogeochemical processes and anthropogenic impacts.
Topics that will be examined includes: an introduction on the seawater origin and evolution; the sources of elements to the ocean and mass balance; the oxygen system, the carbonate system; ocean acidification; nutrient dynamics and limitation; ecosystem box models; trace elements, stable isotopes and their differentiation in trophic levels; anthropogenic impacts; analytical methodologies.
The course includes lectures, exercises, short seminar and presentation on related scientific articles. (analytical laboratory visit is optional).

Grading:

Exercises – obligatory; presentation (ppt) on related scientific articles and a short seminar + questions – 100%; students seminars and external lecturers - attendance obligatory.

Reading List:

Some lectures are based on the following literature:
1. Chester and Jickells (2012).
2. Marine Geochemistry; Broecker W.S. and Peng T.H. (1982). Tracers in the Sea. Eldigio Press, Palisades, N.Y. [Chapters: 1, 2, 3, 5, 6].
3. Sarmiento and Nicolas Gruber (2005). Ocean biogeochemical dynamics.