MAC 605: Chemical Oceanography

Coordinator/Instructor:
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MAC 605: The goal of the course is to facilitate an increase in student understanding of the major disciplines within Chemical Oceanography. It is primarily directed at MAC Graduate Students who need to prepare for their qualifying examinations. The course prerequisite is MAC 503 Introduction to Marine and Atmospheric Chemistry, or permission of instructor.

In general, each week (2 meetings) a single topic is covered. The topic is presented by an expert in the discipline. The first meeting within a topic will normally be presented as a lecture. The second meeting may be a discussion of papers assigned by the lecturer, or additional lecture may be given in the second meeting if deemed necessary. Questions specific to the readings that may be assigned by the instructor must be answered by the students prior to the discussion meeting.

Two term papers, and two oral presentations, are required. Topics must be within the field of chemical oceanography, preferably linked to one of the lecture topics, and approved by the instructor. The final versions will be accepted only after a draft of the paper have been reviewed and revised. The intent here is to expose the students to specifics topics in greater depth, to encourage use and understanding of the literature, and to improve writing and oral presentation skills.

Credits: 3

Office Hours: Drop in, or call/e-mail for an appointment.
Class meets in Room SLAB 236, Monday and Wednesday, 2:30 to 4:00

Textbooks: None required. Readings of primary scientific literature will be assigned.

Grading: Letter grades will be decided based on substantive participation and contributions in the discussions and on the completeness and quality of the term papers.

Week 1 (Jan 17)
1. Introduction to course, and introduction to ODV R. Fine, J. Mathis

Week 2 (Jan 22, 24)
2. Biogeochemistry of Major Nutritive Elements D. Hansell
3. Topic continued D. Hansell
Week 3 (Jan 29, Jan 31)

4. Dissolved Organic Matter  
   D. Hansell

**Approval of topic for 1st term paper required by this date; contact R. Fine**

5. Topic continued  
   D. Hansell

Week 4 (Feb 5, 7)

6. Trace metals  
   F. Millero

7. Topic continued  
   F. Millero

Week 5 (Feb 12, 14)

8. Environmental Microbial/Degradation  
   K. Goodwin

9. Topic continued  
   K. Goodwin

   **First draft of 1st term paper due to R. Fine**

Week 6 (ASLO meeting)  
No Class Meetings

Week 7 (Feb 26, Feb 28)

10. Students present papers, final version of 1st term paper due

11. Carbon Budgets  
    ?R. Wanninkhof

Week 8 (Mar 5, 7)

12. Radiotracers  
    D. Kadko

13. Sediment Chemistry  
    D. Kadko

   **Approval of topic for 2nd term paper required by this date; contact R. Fine**

SPRING RECESS (Mar 12, 14)

Week 9 (Mar 19, 21)

14. Geothermal Vent Chemistry  
    D. Kadko

15. Topics continued  
    D. Kadko

Week 10 (Mar 26, 28)

16. Atmospheric Chemistry, Aerosols & Climate  
    J. Prospero

17. Topic continued  
    J. Prospero

Week 11 (April 2, 4)

18. Marine Organic Geochemistry  
    R. Mead

19. Topic continued  
    R. Mead
Week 12 (April 9, 11)

20. Anthropogenic Tracers of Ocean Circulation  R. Fine

First draft of 2nd term paper due to R. Fine

21. Chemical Tracers of Ground Water  J. Happell

Week 13 (April 16, 18)

22. Aquatic Photochemistry  R. Zika

23. Topic continued  R. Zika

Week 14 (April 23, 25)

24. Our Changing Oceans  R. Fine

25. Students present papers, final version of 2nd term paper due  R. Fine
TEMPLATE FOR TERM PAPERS

Abstract limited to 1 page
Review of the topic including: why it is important to society, highlights of some of the major research papers on the topic. Conclusion to include: what are some of the important issues that are not yet known, if you could what research would you propose on this topic and why.

Page limit for text is 10 pages (in addition at most 1 page Abstract), double spaced 12 point Tms Roman, including Figures and captions.

References to be done in format required for publication in JGR Oceans