

Date	Topic	Reading***	Instructor	Class Project
13-Jan	Introduction to course		FS	
15-Jan	Balancing reaction equations, oxidation state, redox reactions	H	CM	
20-Jan	Gibbs Free Energy and chemical equilibrium	S (1st half)	CM	
22-Jan	Redox and pE-pH diagrams	L ch 7	CM	
27-Jan	Ion speciation	S (2nd half), L ch 5	CM	
29-Jan	Chemical composition of sea water; major constituents	L ch 2, 3, 4	CM	
3-Feb	Trace elements in sea water - I	L ch 11	CM	
5-Feb	Trace elements in sea water - II		CM	
10-Feb	Geochemical differentiation of the earth and origin of the oceans		MM	<b>Term paper topics due</b>
12-Feb	Geochemical reservoirs and transfer processes	L ch 21	MM	
17-Feb	Dissolved gases other than carbon dioxide in sea water	L ch 6	FS	
19-Feb	Carbon dioxide, alkalinity and pH	L ch 15	FS	
24-Feb	<b>*** Mid-Term Exam (covers Jan 15 - Feb 19 lectures) ***</b>		FS	
26-Feb	Nutrients; Aerobic carbon production and consumption	L ch 8 & 9	FS	
3-Mar	Aerobic to anaerobic diagenesis in sediments	L ch 12	BG	
5-Mar	Biogenic production, carbonate saturation and sediment distributions	L ch 15 & 16	BG	
10-Mar	Fluxes from high temperature reactions along the mid-ocean ridge axis	L ch 19	MM	
12-Mar	Fluxes from diagenesis deep in sediments and basement		MM	
17-Mar	Organic compounds in sea water	L ch 22, 23	FS	
19-Mar	Oceanic water mass tracers	L ch 10 & 24	FS	
31-Mar	Stable isotopic tracers	L ch 29	FS	
2-Apr	Radio-isotopic tracers	L ch 28	FS	
7-Apr	Air-sea exchange	L ch 6 (2nd half)	BH	<b>First draft of term papers due</b>
9-Apr	Atmosphere and climate change		BH	
14-Apr	Estuaries: classification and mixing processes		BG	<b>Reviews of term papers due</b>
16-Apr	Biogeochemical modelling of estuaries	H	BG	
21-Apr	Oceans and climate	L ch 25	BG	
23-Apr	Evolution of oceanic chemical cycles		BG	
28-Apr	Student presentations - I		BG	<b>Final draft of term papers due</b>
30-Apr	Student presentations - II		BG	
5-May	Student presentations - III		BG	
14-May	<b>***Final Exam</b> Note: time is 9:45 - 11:45 am***		FS	

**Class:** Tuesday & Thursday, 10:30 - 11:45 am, MSB 315

**Q & A sessions:** TBA

**Course Coordinator:** Frank Sansone, MSB 205, x62912, sansone@hawaii.edu

Office hours: 12-1 pm on days he lectures; call to make appointments for other times

**Instructors:** Brian Glazer, Barry Huebert, Chris Measures, Mike Mottl, Frank Sansone

**Teaching Assistant:** Courtney Daniels, MSB 215A, x62014, cfritz@hawaii.edu

**Readings:** L = Libes, *Marine Biogeochemistry, 2nd Ed.* (course text); S = Snoeyink and Jenkins; H = Handout

**\*\*\* Note that readings listed here are for the 1st edition of the text. These will be revised (if necessary) once the 2nd edition is shipped in late January**

**Final grade** = 25% final exam; 25% mid-term exam; 30% term paper, first draft, and oral presentation;  
20% problem sets and class participation

## OCN 623 - STUDENT LEARNING OUTCOMES

Upon successful completion of the course, students are expected to be able to:

- 1) Explain the underlying principles of chemical and biogeochemical cycling in marine systems;
- 2) Identify marine chemical and biogeochemical processes that impact the student's areas of oceanographic interest, and know how to access and understand information on these processes;
- 3) Use written and oral communication to clearly explain marine chemical and biogeochemical processes and related contemporary research.