

## SYLLABUS Spring 2022

### Biogeochemistry – SIO 267

Tues. - Thurs. 3:30-4:50 pm Vaughn Hall 328

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Prerequisites: *SIO 260 (Marine Chemistry), Inorganic Chemistry, Calculus*

Texts: *Ocean Dynamics and the Carbon Cycle*, Williams and Follows (2011) Cambridge\*

*Biogeochemistry: An analysis of global change*, Schlesinger and Bernhardt (2013)\*

*Earth System Science*, Jacobson et al. (2000) Academic Press\*\*

*Ocean Biogeochemical Dynamics*, Sarmiento and Gruber, Princeton (2006)\*

*Terrestrial biosphere-atmosphere fluxes*, Monson and Baldocchi, Cambridge (2014)\*\*

\*Available through Roger as EBook. \*\*Requested as Ebook.

Units: 4. Grade: Letter grade only; 25% problem sets, 25% Midterm, 50% Term Paper

Date	Due	Lecture	Background reading
Tue Mar 29	R	1. Course overview	
Thu Mar 31	R	2. Isotope basics PS1	Earth System Science Chap. 4.1-4.2
Tue Apr 5	R	3. Hydrological cycle & isotope PS1	Earth System Science Chap. 7 Earth System Science Page 471
Thu Apr 7	R PS1	4. Box models & transport PS2	Williams and Follows, 3.1-3.2
Tue Apr 12	R	5. Radiocarbon: tracer and clock PS3	Broecker: Treatise on Geochem.
Thu Apr 14	R PS2	6. Aqueous chemistry of CO <sub>2</sub> PS3	Williams & Follows, 6.1-6.3
Tue Apr 19	R	7. Aqueous chemistry of CO <sub>2</sub> PS3	
Thu Apr 21	R PS3	8. Air-sea gas exchange PS4	Williams & Follows, 6.6
Tue Apr 26	R	9. Anthropogenic carbon	Williams & Follows, 6.5
Thu Apr 28	R PS4	10. Carbonate chemistry and PS5 ocean acidification	Earth System Science Chap. 10 (Biogeochemistry Chap. 5)
Tue May 3	R	11. Land Carbon Sink	
Thu May 5	R PS5	12. CO <sub>2</sub> fertilization PS6- not graded	Monson and Baldocchi, 4.2, Chap 5
Tue May 10	R	13. Carbon-water relationships	
Thu May 12	R	MIDTERM	
Tue May 17	J	14-15. CO <sub>2</sub> on glacial and 10 <sup>6</sup> -yr time scales	
Thu May 19	J	16-17. Methane, N <sub>2</sub> O and Ice-core records	
Tue May 24	J	18. Atmospheric O <sub>2</sub>	
Thu May 26	J	19. Snowball Earth	
Tue May 31	J	Presentations 1	
Thu Jun 2	J	Presentations 2	
Wed Jun 8	J	Term Paper due	