

SIOC205 ESTUARINE & COASTAL PROCESSES SYLLABUS – SPRING 2018

SIOC 205, section 942462, 4 units

Instructor: Sarah Giddings, sarahgid@ucsd.edu

Class meetings: 03 April – 08 June, Tues, Thursday 09:00-10:20, room TBD

Office hours: TBD

Course Summary

This course will cover estuarine and coastal processes. While the bulk of the course will focus on the physical dynamics, topics will include biological, chemical, and ecosystem dynamics and interactions in estuaries and river plumes. The course will cover the following topics: Review of fluid mechanics, open channel flow (turbulence and the bottom boundary layer), tides (origin and propagation in estuaries), stratified turbulence, estuarine classification and types (mixed, fjords, inverse, etc.), tidally averaged dynamics, subtidal time dependence, intratidal variations, lateral processes, dispersion mechanisms, sediment transport, glacial fjords, estuarine productivity (including nutrient delivery, eutrophication and oxygen depletion), estuarine ecosystems (benthic, intertidal, fisheries, etc.), river plumes, wind-driven coastal upwelling, and estuarine fronts. *The exact schedule and topics will be adjusted based on student's interests!*

Requirements:

While there are no required classes to participate in this class, some introduction to fluid mechanics or physical oceanography is helpful as is introductory calculus. Several homework assignments also are greatly simplified by using more advanced analysis tools (such as MATLAB or Python). Please check with the instructor if you have concerns about your background but note that *this course is intended to be for an interdisciplinary group of students.*

Credit & homework:

Grades will be based on homework (20%), in-class participation (30%), and a final project + presentation (roughly 50%). The final project will include data analysis and presentation of results from existing estuarine datasets and/or data collected during this class.

References:

Textbooks:

There are many textbooks that are compilations of papers about estuaries but no definitive text for this class. Thus we will be pulling from a variety of texts and papers. Some of particular interest that may be worth purchasing:

- Contemporary Issues in Estuarine Physics, 2010, Ed. A Valle-Levinson. Cambridge University Press. Available on-line through UCSD at <http://ebooks.cambridge.org/ebook.jsf?bid=CBO9780511676567>
- Estuarine Ecology, 2013, JW Day, BC Crump, WM Kemp, A Yáñez-Arancibia. Wiley-Blackwell. Available on-line through UCSD at <http://onlinelibrary.wiley.com/book/10.1002/9781118412787>

Also check out:

- Treatise on Estuarine and Coastal Science, 2011, Ed. E Wolanski and D McLusky. Elsevier, Inc. Available on-line through USCD at <http://www.sciencedirect.com/science/referenceworks/9780080878850#ancv1>
- Mixing in Inland and Coastal Waters, 1979, HB Fisher, EJ List, RCY Koh, J Imberger, and NH Brooks. Academic Press.