

## **SIOC205 ESTUARINE & COASTAL PROCESSES SYLLABUS – SPRING 2020**

SIOC 205C, section 2123, 4 units

*Instructor:* Sarah Giddings, sgiddings@ucsd.edu

*Class meetings (online!):* 31 March – 04 June, Tues, Thursday 09:00-10:20, live online lectures

*Zoom lecture link:* contact instructor or view through Canvas

*Zoom office hours:* TBD or by appointment

### **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:**

In the past this course was heavily weighted by in-class participation. Given the current remote-only learning situation, this will no longer be part of the grade. Grades will be based on homework (50%) and a final project presentation (25%) and report (25%). Homework assignments are due by midnight on the due date, submitted as pdf files through Canvas. While most of this class encourages working in groups, submitted homework solutions must be the work of the submitting student (i.e., so even if you work together, no group reports). The final project will include data analysis and presentation of results from existing estuarine/coastal datasets and/or data collected during this class. I always encourage students to try to leverage their own research whenever possible, even if their work is not in an estuary or coastal region. Applying some of the concepts learned in this class to different environments can actually be quite fruitful.

### **Unusual circumstances for Spring 2020:**

Given our unusual remote-only situation for Spring 2020, and more importantly, the immense stressors on all of us given the Covid19 virus enforced shelter-at-home circumstances, it is likely to be an unusual term. As the UCSD campus community transitions to online instruction and working from home, please be aware that your Professors and Administrators are adapting at the same time that you are. For example, I have moved course content to Canvas for the first time, so please be patient as there are likely to be glitches. Most importantly, let us all pledge to remain respectful, supportive, and adaptable to ensure that educational goals are met. All participants in the course are bound by the UCSD Code of Conduct, found at: <https://students.ucsd.edu/sponsor/student->

conduct/policiesandprocedures.html. Please reach out to me directly if there are issues prohibiting your full engagement in the course so that we can find a workable solution.

### **Online Classroom Instruction Policies:**

I will be posting all course material in Canvas, and also sending announcements via Canvas, so please make sure you are able to access Canvas and contact me if you are not.

This course will be taught using live, online audio and visual instruction and will take place during the times indicated in the UCSD Schedule of Classes (and above). Live lecture attendance is not required, but is highly encouraged so that questions can be asked and answered during the lecture and interactive full group and small group discussions can be carried out. Given the occasional disruptions that inevitably occur when using online conferencing tools (due to WiFi drops, service drops, etc.) we will adhere to the following plan of action for each online class meeting:

1. Each course lecture will be initiated using Zoom: (links available through Canvas or contacting instructor)
2. If Zoom fails for a given lecture, we will switch to Explain Everything: (links available through Canvas or contacting instructor)

All lectures will be recorded and posted to Canvas in a timely manner so that they are available asynchronously. Please be aware that you will be recorded if you choose to turn on your video and audio. Lecture notes will always be available in the event that lecture recording fails.

### **Netiquette:**

Hopefully with our small class, this will not be a major issue, however, methods to minimize background noise and to promote clear communications during live online lectures, please keep your microphone on MUTE when you are not talking and consider using headphones.

### **Integrity:**

Given the nature of the homework and assessments in this class, cases of academic dishonesty are a low risk, nevertheless, it is worth mentioning that academic integrity is expected. Homework assignments or final reports that are copied directly from other students will receive no credit. Of particular importance to this class is appropriate attribution for any references (published or on-line material) used in the homework and final report.

### **References:**

There are many 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 include :

- 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.