**Course Description:** First of two-course sequence. This fast-paced two-course sequence provides an advanced introduction to marine systems. The sequence covers multiple scales, from cells to ocean basins. It is structured in three discipline-centric segments (cross-scale circulation processes, marine biogeochemistry, and marine organisms). Estuaries and Ocean Systems I covers marine biogeochemistry and physical oceanography, while Estuaries and Ocean Systems II covers marine organisms and their role in the environment.

| Credit hours: | 4 |
| **Prerequisites or Concurrent Enrollment Requirements:** | |
| **Term, Year, and Campus:** | Winter, 2014, Marquam Hill |
| **Faculty Information:** | Name: Joseph Needoba  
E-mail: needobaj@ohsu.edu  
Phone: 503-346-3421  
Address & Office Number: HRC 3, Room 314  
Office Hours: TBD |
| | Name: Tawnya Peterson  
E-mail: petertaw@ohsu.edu  
Phone: 503-346-3423  
Address & Office Number: HRC3, Room 316  
Office Hours: TBD |
| **General Course Meeting Day and Time:** | Tues, Thurs 9:00-10:50 AM |
| **Course Objectives, Competencies, or Outcomes** | Estuary and Ocean Systems I (EOS-I) provides a comprehensive introduction to the physics and chemistry of marine systems, covering topics such as ocean and estuarine circulation, waves, tides, chemistry of seawater, and marine biogeochemistry. Working knowledge of these topics will be tested through assignments that incorporate the use of data from large publicly available data sets and through individual student projects and presentations about relevant issues in marine science. Upon completion of EOSI students will be able to:  
1) Identify and describe the forces that drive ocean circulation;  
2) Understand how the atmosphere and ocean interact;  
3) Explain the processes responsible for the distribution of elements in the oceans;  
4) Seek out and use data from national and international databases containing data collected from marine environments;  
5) Explain the role of the oceans and estuaries in climate change and environmental health issues;  
6) Identify the important and current issues affecting ocean ecosystems. |
### Required Texts or Readings:

   


### Supplemental or Suggested Readings or Reference Materials:

Chemical Oceanography and Marine Carbon Cycle (Emerson & Hedges)

### Attendance Requirements:

All scheduled class times

### Grading Criteria, Academic Standards, & Release of Final Grades:

Final course grades will be posted with the OHSU Registrar the Monday following the last day of the term. OHSU’s grading system for official grade reports includes:

- 4.0 = Exceptional
- 3.0 = Superior
- 2.0 = Average
- 0.0 = Failure

Grading:

- Assignments: 20%
- Student project: 25%
- Student presentation: 25%
- Final exam: 50%

### Copyright Information:

Every reasonable effort has been made to protect the copyright requirements of materials used in this course. Class participants are warned not to copy, audio, or videotape in violation of copyright laws. Journal articles will be kept on reserve at the library or online for student access. Copyright law does allow for making one personal copy of each article from the original article. This limit also applies to electronic sources.

### Syllabus Changes and Retention:

This syllabus is not to be considered a contract between the student and Graduate Studies. It is recognized that changes may be made as the need arises. Students are responsible for keeping a copy of the course syllabus for their records.

### Accommodations:

Our program is committed to all students achieving their potential. If you have a disability or think you may have a disability (physical, learning, hearing, vision, psychological) which may need a reasonable accommodation, please contact Student Access at 503-494-0082 to discuss your needs. Because accommodations can take time to implement, it is important to have this discussion as soon as possible. All information regarding a student’s disability is kept in accordance with relevant state and federal laws.

You may also visit [http://www.ohsu.edu/academic/acad/osahome.html](http://www.ohsu.edu/academic/acad/osahome.html) to identify your Program Accommodation Liaison (PAL). Click Access Services.
## COURSE OUTLINE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics Covered and Due Dates</th>
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| Week 1 | 1) **Lecture 1** – History and current state of oceanographic research  
          2) **Lecture 2** – The physical setting: description of ocean environments |
| Week 2 | 1) **Lecture 3** – Physical properties of the oceans  
          2) **Lecture 4** – Atmosphere-ocean interactions |
| Week 3 | 1) **Lecture 5** – Ocean circulation – deep currents  
          2) **Lecture 6** – Ocean circulation – surface currents |
| Week 4 | 1) **Lecture 7** – Waves  
          2) **Lecture 8** – Tides |
| Week 5 | 1) **Lecture 9** – Estuarine Circulation  
          2) **Lecture 10** – Chemistry of seawater |
| Week 6 | 1) **Lecture 11** – Biogeochemical cycles: N, P, and Si  
          2) **Lecture 12** - Biogeochemical cycles: trace metals |
| Week 7 | 1) **Lecture 13** - Biogeochemical cycles: gases  
          2) **Lecture 14** - Biogeochemical cycles: estuaries |
| Week 8 | 1) **Lecture 15** - Biogeochemical cycles: carbonate chemistry  
          2) **Lecture 16** - Oceans and climate change |
| Week 9 | 1) **Lecture 17** – Ocean and Estuary observing systems  
          2) **Lecture 18** - Remote Sensing |
| Week 10 | 1) **Student Presentations**  
          2) **Student Presentations** |
| Week 11 | **Final Exam** |