ESM 321  Environmental Systems II  Winter 2015

Where/When:
Instructor:
Office hours:
Readings posted in D2L
Prerequisites:  Required: ESM 320; recommended: calculus, chemistry, biology, ecology
Co-requisite:  ESM 324 (laboratory course)
Lecture notes:  Will be placed online in D2L before the lecture
Homework:  HW1, HW2, HW3 will be posted online in D2L. HW1 and HW2 must be submitted in hard copy in class on the day they are due. Students must sign up for a time slot for HW3 during class.

Course schedule:  REVISED 2/5/2015

<table>
<thead>
<tr>
<th>Week (T, R)</th>
<th>Lecture Topic</th>
<th>Readings</th>
<th>Assignments/Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Jan 6, 8</td>
<td>Ecosystems, Ecological principles</td>
<td>W1</td>
<td></td>
</tr>
<tr>
<td>2: Jan 13, 15</td>
<td>Intro to statistics, Community structure</td>
<td>R1, B1; B3, B5</td>
<td>Q1</td>
</tr>
<tr>
<td>3: Jan 20, 22</td>
<td>Primary production</td>
<td>W2; R2</td>
<td>HW1: Jan 22</td>
</tr>
<tr>
<td>4: Jan 27, 29</td>
<td>Secondary production, Decomposition</td>
<td>W3; W4</td>
<td>Q2</td>
</tr>
<tr>
<td>5: Feb 3, 5</td>
<td>Midterm, Elements/soil</td>
<td>Exam; W5</td>
<td>Midterm: Feb 3</td>
</tr>
<tr>
<td>6: Feb 10, 12</td>
<td>C cycle, N cycle</td>
<td>W6; W7</td>
<td>Q3</td>
</tr>
<tr>
<td>7: Feb 17, 19</td>
<td>P cycle, Synthesis</td>
<td>W8; W9, R3</td>
<td>Q4</td>
</tr>
<tr>
<td>8: Feb 24, 26</td>
<td>Heterogeneity, Controls</td>
<td>W10; W11</td>
<td>HW2: Feb 24</td>
</tr>
<tr>
<td>9: Mar 3, 5</td>
<td>Watershed management, Dams</td>
<td>R4; W14</td>
<td>Q5</td>
</tr>
<tr>
<td>10: Mar 10, 12</td>
<td>Restoration, Frontiers/review</td>
<td>R5; W17</td>
<td></td>
</tr>
</tbody>
</table>

Final Exam Tues, Mar 17, 1015-1205
**Course overview and objectives**

This course focuses on ecosystem science, which is the study of how energy and materials move through organisms (microbes, plants, animals) and the non-living environment (soils, atmosphere, water). Cycles of energy and matter are fundamental to all life on Earth, and they provide ecosystem services that human societies rely on. Understanding how terrestrial and aquatic ecosystems work is essential to managing natural resources and to addressing environmental problems from local to global scales.

Part 1 of this course will introduce ecosystem science and energetics (primary production, secondary production, and decomposition), while Part 2 will focus on biogeochemistry (cycles of the major elements: C, N, and P) and the factors that control ecosystem processes. The last two weeks will serve to integrate concepts through case studies and examples.

Through this course, students will gain an understanding of:

- the ecosystem approach to environmental science
- important interactions between living and nonliving components of terrestrial and aquatic systems
- how human activities impact ecosystems

**Grade distribution:** Participation 10%, Homework 20%, Quizzes 20%, Midterm 20%, Final Exam 30%.

**Participation:** Participation marks will be based both on attendance and on in-class participation. There will be opportunities for in-class problem-solving, discussions in small groups, short writing assignments (pass-fail), and other activities. Please bring extra paper and a pen to class. Missing a class will only be excused with prior notice to the instructor, and at her discretion.

Lecture materials include topics that are fundamental to student success in ESM 324 (lab course), so students are advised that missing lectures may adversely affect their performance in the lab as well.

**Homework:** HW1 and HW2 will be extensive problem-solving assignments posted online. Assignments are due in hard copy at the beginning of class on the due date. Late assignments will lose 10% credit each day they are late and will not be accepted 7 days after the original due date.

HW3 will be a 3-minute individual presentation (plus 1 minute for questions). Students are responsible for signing up for presentation slots during class throughout the term. Specific instructions for the presentations will be posted online.

**Quizzes:** Five brief, closed-book quizzes will be administered in class on either day, based on the reading assignments for the current week. The lowest quiz grade will be dropped.

**Exams:** Exams will be closed-book and open-note, and without computers except handheld calculators. Exams will be cumulative.

**Communication and academic support:** E-mail is an excellent mode of communication between students and instructors. Students are advised that the instructor may convey important details or clarifications through e-mail. Students are therefore responsible for making sure that the instructor has their primary e-mail address and for checking their e-mail regularly. Please allow 24 hours (48 hours on weekends) for a response to e-mailed questions. Students are encouraged to use office hours or appointments for in-depth questions and interactions. Please do not leave voicemail, as it is unlikely to be promptly received.

**Academic integrity:** Students are expected to conduct themselves in class and outside of class in a manner that is respectful to themselves, their classmates, instructors, and the university. This means not only avoiding academic misconduct (see: [http://www.pdx.edu/dos/academic-misconduct-0](http://www.pdx.edu/dos/academic-misconduct-0)), but promoting a positive atmosphere for learning and personal growth.

**Special accommodations:** If a student’s personal circumstances are such that he or she needs or develops a need for accommodations, including for medical problems, the instructor must be advised as soon as possible.