Stream Ecology

FW580

Instructor
Dr. Dana Warren
dana.warren@oregonstate.edu

Office Hours
D. Warren: W 10:30-noon and by appointment

Class Schedule
Lecture: Tu/Th: 2:00 – 3:20

Course web site
Blackboard FW 580

Course Description:

This course will introduce students to major conceptual themes in ecology of running waters. People have long had a fascination with streams and rivers, which are critical for human well-being as sources of water and food, recreation, power, navigational routes, conduits for effluents, and aesthetic enjoyment. Moreover, running waters represent ideal ecosystems for understanding many ecological phenomena, hence some classic ecological studies have been conducted in stream and river systems. Our goals for this course are to gain an understanding of: 1) major physical and biological features of streams and rivers, 2) the range of diversity of running waters around the world, 3) fundamental processes producing patterns of riverine structure and function, and 4) critical issues associated with the conservation and management of streams and their biota.
# LECTURE SCHEDULE
## Spring 2014

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>CHAP</th>
<th>READING</th>
<th>LECTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tu April 1</td>
<td>Introduction to the class</td>
<td></td>
<td></td>
<td>Warren</td>
</tr>
<tr>
<td>Th April 3</td>
<td>Overarching concepts and common terms</td>
<td>1, 14</td>
<td>1, 2</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu April 8</td>
<td>Hydrology and geomorphology 1</td>
<td>2</td>
<td>3</td>
<td>Warren</td>
</tr>
<tr>
<td>Th April 10</td>
<td>Hydrology and geomorphology 2</td>
<td>3</td>
<td>4</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu April 15</td>
<td>Hyporheic zones/substrate/ stream temperature</td>
<td>5</td>
<td>5</td>
<td>Warren</td>
</tr>
<tr>
<td>Th April 17</td>
<td>Stream chemistry</td>
<td>4</td>
<td>6</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu April 22</td>
<td>Nutrient spiraling and trophic responses</td>
<td>11</td>
<td>7</td>
<td>Warren</td>
</tr>
<tr>
<td>Th April 24</td>
<td>Linkages 1 (longitudinal)</td>
<td></td>
<td>8, 9</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu April 29</td>
<td>Linkages 2 (lateral)</td>
<td></td>
<td>10, 11</td>
<td>Warren</td>
</tr>
<tr>
<td>Th May 1</td>
<td>Basins, river networks and a landscape perspective of streams</td>
<td></td>
<td>12, 13</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu May 6</td>
<td><strong>Mid-term exam</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th May 8</td>
<td>Primary production and herbivory</td>
<td>6, 12 (pp 287-290)</td>
<td>14</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu May 13</td>
<td>Organic matter and detritivory</td>
<td>7, 8 (pp 263-267)</td>
<td>15</td>
<td>Warren</td>
</tr>
<tr>
<td>Th May 15</td>
<td>Invertebrate ecology and communities</td>
<td>9, 10</td>
<td>16</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu May 20</td>
<td>Vertebrate communities and food webs</td>
<td>9, 10</td>
<td>17</td>
<td>Warren</td>
</tr>
<tr>
<td>Th May 22</td>
<td>Trophic relationships and spp interactions</td>
<td>8</td>
<td>18</td>
<td>Warren</td>
</tr>
<tr>
<td>Fr May 23</td>
<td><strong>Submit meta-analysis by 5:00 PM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tu May 27</td>
<td>Species interactions/patch dynamics</td>
<td>9</td>
<td>19</td>
<td>Warren</td>
</tr>
<tr>
<td>Th May 29</td>
<td>Disturbance and succession</td>
<td></td>
<td>20, 21</td>
<td>Warren</td>
</tr>
<tr>
<td>Tu June 3</td>
<td>Trajectories of change in river networks</td>
<td>13</td>
<td>22, 23</td>
<td>Warren</td>
</tr>
<tr>
<td>Th June 6</td>
<td>River restoration and management</td>
<td>13</td>
<td>24, 25</td>
<td>Warren</td>
</tr>
</tbody>
</table>

**June 9-12** Take-home Final Exam
Readings

Text:

Additional Readings:
1) Ward 1989
2) Chapin – Chapter 1
3) Poff 1997
4) Poole 2010
5) Stanford and Ward 1993
6) TBD
7) Mulholland and Webster 2010, Stream Solute Workshop
8) Fisher et al 1998 – Telescoping ecosystem model
9) Vanotte et al 1980
10) Tockner et al 2000
11) Sponseller et al 2013 importance of water
12) Johnson and Host 2010
13) Benda et al 2004
14) Larned 2010 - periphyton
15) Finlay 2010 – stream microbial ecology
16) Townsend 1997
17) Power and Deitrich 2002
18) Baxter 2004
19) Winemiller et al 2010 – patches
20) Townsend et al 1997
21) Lytle and Poff 2004
22) McPhee 1989
23) Valett et al 2004
24) Berhardt et al. 2008
25) Beechie et al. 2008

Assignments and Exams

1) **Mid-term:** We will have an exam in the middle of the quarter focusing more on technical terms and concepts discussed in the first part of the term.
2) **Meta-analysis paper:** You will be required to do a literature review and conduct a meta-analysis to answer a concise question in stream ecology. See additional details.
3) **Final exam:** The final exam will be a take-home exam, focusing on integration of the ideas covered in the class.
4) **Class Discussions:** We will discuss readings in class. You will be expected to contribute to these discussions.
Value of Each Portion of the Course:

<table>
<thead>
<tr>
<th>Portion</th>
<th>Percent of grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term Exam (80 points)</td>
<td>26%</td>
</tr>
<tr>
<td>Meta-Analysis paper, (100 points)</td>
<td>33%</td>
</tr>
<tr>
<td>Final Exam, (100 points)</td>
<td>33%</td>
</tr>
<tr>
<td>Participation (20 pts)</td>
<td>8%</td>
</tr>
</tbody>
</table>

Total potential points: 300

Course Policies

Attendance:
Poor attendance is often the cause for poor grades. Please attend all lectures and laboratory sessions.

Readings:
Students should prepare for lecture by reading the relevant chapter in the textbook or the primary literature for that lecture which will be provided well ahead of time on the course website.

Tardiness:
I intend to start classes on time. Arriving late disturbs other students already present and disrupts the learning process. Please be considerate and plan to be on time.

Cell phones:
Please remember to turn off audible cell phones and pagers during class. Repeated issues of cell phone problems will be treated on a case-by-case basis. Regular or continued disruption of the class after two warnings will affect your grade.

Incomplete grades:
A grade of incomplete will only be assigned for students who are physically unable to complete the course due to serious illness or injury. Students are responsible for understanding and following all university and departmental policies that apply to
removing a grade of incomplete from their record, and for understanding the circumstance that can cause an incomplete grade to convert to a grade of F.

**College Policies**

**Students with Disabilities:**
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately.

**Rules on Civility and Honesty:**
Please follow the College rules on civility and honesty. These can be found at (insert here). Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations. Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- **CHEATING** - use or attempted use of unauthorized materials, information or study aids or an act of deceit by which a student attempts to misrepresent mastery of academic effort or information. This includes unauthorized copying or collaboration on a test or assignment or using prohibited materials and texts.

- **FABRICATION** - falsification or invention of any information (including falsifying research, inventing or exaggerating data and listing incorrect or fictitious references.

- **ASSISTING** - helping another commit an act of academic dishonesty. This includes paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, or taking a test/doing an assignment for someone else (or allowing someone to do these things for you). It is a violation of Oregon state law to create and offer to sell part or all of an education assignment to another person (ORS 165.114).

- **TAMPERING** - altering or interfering with evaluation instruments and documents.

- **PLAGIARISM** - representing the word or ideas of another person as one's own OR presenting someone else's words, ideas, artistry or data as one's own. This includes copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project, then submitting it as one's own.

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.