FAS 6932

**Freshwater Ecology**, 3 credit hours, meets M W F period 7 (1:55-2:45)

**Prerequisites:** 2 semesters of undergraduate general biology coursework

**Professor:** Dr. Lindsey Reisinger
  - lreisinger1@ufl.edu
  - (352) 294-1355
  - Office hours: by appointment


Additional papers from the primary literature will be assigned throughout the semester.

**Course Description:**

This course is designed to provide students with a comprehensive understanding of key concepts in freshwater ecology. Material will focus on physical and chemical aspects of freshwater ecosystems, major groups of freshwater organisms, and the ecological processes that affect freshwater communities and ecosystems.

The class will be structured as a combination of lectures, discussions, and readings. Weekly readings will typically consist of a portion of the text from Dodds and Whiles as well as one paper from the primary literature. Each student will lead one discussion of the primary literature over a portion of one class and will research and present additional background material on that topic. Students will also lead an online discussion of the primary literature. In addition, each student will write a review of one paper from the primary literature during the semester.

**Student Learning Outcomes:**

At the end of the course, students will be able to:

- Describe principal physical, chemical, and biotic aspects of freshwater ecosystems
- Explain ecological processes controlling freshwater communities and ecosystems as well as human impacts on these systems
- Examine scientific data and identify the ecological processes that influence the findings
- Critically evaluate scientific literature related to freshwater ecology
- Design effective freshwater ecology experiments
- Successfully present scientific information

**Examinations/Assignments:**

Assignments will be described in class, and grading rubrics will be provided.

Class participation is an essential part of the class. Students can participate by actively contributing to class discussions and activities.

Once during the semester, students will lead a discussion of the assigned primary literature and prepare a presentation (15 minutes) that expands on the topic.

Students will also write a review of one of the papers from the primary literature, which will be assigned at the beginning of the semester based on student interest in the topic.
To encourage critical evaluation of scientific papers, graduate students will contribute to an online discussion of primary literature prior to class on the days where primary literature will be discussed (typically once per week). A computer with internet connection is required. The UF Canvas E-Learning site can be accessed at http://elearning.ufl.edu/ using your Gatorlink account. Undergraduates will also be able to post on this online discussion forum, but, while graduate students are required to participate in the online discussion, undergraduates will not be required to participate.

There will be two exams over the course of the semester as well as a final exam. Each exam will be cumulative and cover new material as well as material from earlier in the semester.

**Evaluation of Student Learning:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percent of Grade</th>
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<tbody>
<tr>
<td>Class participation</td>
<td>10%</td>
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<tr>
<td>Presentation/leading discussion</td>
<td>10%</td>
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<tr>
<td>Review</td>
<td>10%</td>
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<tr>
<td>Online discussion</td>
<td>10%</td>
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<tr>
<td>Exam 1</td>
<td>10%</td>
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<tr>
<td>Exam 2</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
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**Assignment Percent of Grade**

A 94-100%; A- 90-93; 
B+ 86-89; B 83-85; B- 80-82; 
C+ 76-79; C 73-75; C- 70-72; 
D+ 66-69; D 63-65; D- 60-62; 
E <60%

**Schedule of Class Topics:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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</thead>
<tbody>
<tr>
<td>Aug 22</td>
<td>Course overview/introductions</td>
<td></td>
</tr>
<tr>
<td>Aug 24</td>
<td>Importance of freshwater ecosystems</td>
<td></td>
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<tr>
<td></td>
<td>Physical and chemical properties of water</td>
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<tr>
<td>Aug 27</td>
<td>Groundwater and the hydrologic cycle</td>
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<tr>
<td>Aug 29</td>
<td>Wetland habitats</td>
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<tr>
<td>Aug 31</td>
<td>Reading discussion 1 (water availability; led by Dr. Reisinger)</td>
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<tr>
<td>Sept  5</td>
<td>Lakes and reservoirs</td>
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<tr>
<td>Sept  7</td>
<td>Flowing waters</td>
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<tr>
<td>Sept 10</td>
<td>Reading discussion 2 (land use)</td>
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<tr>
<td>Sept 12</td>
<td>Major groups of freshwater organisms (microbes, plants)</td>
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<tr>
<td>Sept 14</td>
<td>Major groups of freshwater organisms (animals)</td>
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<tr>
<td>Sept 17</td>
<td>Dichotomous key exercise</td>
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<tr>
<td>Sept 19</td>
<td>Evolution and biodiversity of freshwaters</td>
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<td>Sept 21</td>
<td>Biological invasions</td>
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<tr>
<td>Sept 24</td>
<td>Reading discussion 3 (extinctions, biological invasions)</td>
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<tr>
<td>Sept 26</td>
<td><strong>Exam 1</strong></td>
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<tr>
<td>Sept 28</td>
<td>Light, temperature, and stratification</td>
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<tr>
<td>Oct  1</td>
<td>Oxygen and aquatic chemistry controlling nutrient cycling</td>
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<td>Oct  3</td>
<td>Carbon</td>
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<tr>
<td>Oct  5</td>
<td>Reading discussion 4 (browning)</td>
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<tr>
<td>Oct  8</td>
<td>Nutrients and their cycles</td>
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<tr>
<td>Oct 10</td>
<td>Nutrient use and remineralization</td>
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<tr>
<td>Oct 12</td>
<td>Reading discussion 5 (nutrient pollution, stoichiometry)</td>
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<tr>
<td>Oct 15</td>
<td>Trophic state and eutrophication</td>
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<tr>
<td>Oct 17</td>
<td>Toxic chemicals and pollutants</td>
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<tr>
<td>Oct 19</td>
<td>Reading discussion 6 (eutrophication, pharmaceuticals)</td>
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<tr>
<td></td>
<td>Chapter 2 and 3</td>
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<td>Chapters 4 and 5</td>
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<td>Chapter 6 and 7 (pages 107 – 156)</td>
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<td>Chapters 8, 9 and 10</td>
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<td>Chapter 11</td>
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<td></td>
<td>Chapter 7 (pages 156-165)</td>
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<td>Chapters 12 and 13</td>
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<td>Chapter 14 and 17</td>
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<td>Chapters 16 and 18</td>
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<td>Date</td>
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<tr>
<td>Oct 22</td>
<td>Freshwater ecosystem ecology</td>
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<td>Oct 24</td>
<td>Freshwater ecosystem ecology 2</td>
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<tr>
<td>Oct 26</td>
<td>Reading discussion 7 (biodiversity and ecosystem function)</td>
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<tr>
<td>Oct 29</td>
<td><strong>Exam 2</strong></td>
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<td>Oct 31</td>
<td>Behavioral interactions: microorganisms and invertebrates</td>
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<td>Nov 5</td>
<td>Interspecies interactions: detritivory, herbivory, omnivory</td>
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<tr>
<td>Nov 7</td>
<td>Interspecies interactions: predation, parasitism</td>
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<tr>
<td>Nov 9</td>
<td>Reading discussion 8 (trophic cascades)</td>
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<tr>
<td>Nov 14</td>
<td>Food webs</td>
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<tr>
<td>Nov 16</td>
<td>Interspecies interactions 2: facilitation, competition, eco-evolutionary</td>
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<tr>
<td>Nov 19</td>
<td>Reading discussion 9 (eco-evolutionary dynamics)</td>
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<tr>
<td>Nov 26</td>
<td>Fish ecology and Fisheries</td>
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<tr>
<td>Nov 28</td>
<td>Reading discussion 10 (fish ecology)</td>
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<tr>
<td>Nov 30</td>
<td>Complex community interactions</td>
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<tr>
<td>Dec 3</td>
<td>Complex community interactions 2</td>
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<tr>
<td>Dec 5</td>
<td>Reading discussion 11 (regime shifts, metacommunities)</td>
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**Primary Literature**

Reading discussion 1 (water availability):

Reading discussion 2 (land use):

Reading discussion 3 (extinctions, biological invasions):

Reading discussion 4 (browning):

Reading discussion 5 (nutrient pollution, stoichiometry):

Reading discussion 6 (eutrophication, pharmaceuticals):

Reading discussion 7 (biodiversity and ecosystem function):

Reading discussion 8 (trophic cascades):
Ecology 77:725–735.

Reading discussion 9 (eco-evolutionary dynamics):

Reading discussion 10 (fish ecology):

Reading discussion 11 (regime shifts, metacommunities):

Students Requiring Accommodations
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

University Honesty Policy
UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct/honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor of this course.

Counseling and Wellness Center
Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/, (352) 392-1575
Contact information for University Police Department: (352) 392-1111 or 9-1-1 for emergencies.