Course Description and Goals: This course is similar to a traditional limnology course in that it examines the physical, chemical, and biological processes occurring in lakes, streams, and other inland water bodies. The name waterscape ecology has been chosen to emphasize the linkages among inland water bodies within any region and between water bodies and the surrounding landscape. Landscape is defined as “the landforms of a region in aggregate” (Webster’s Ninth New Collegiate Dictionary) and by extension a waterscape could be defined as the water bodies of a region in aggregate. This course assumes a basic knowledge of ecology and chemistry. Students will learn the requisite hydrology and fluvial geomorphology to understand the physical structure of streams and how that in turn influences the water chemistry and ecology of streams. Factors affecting the physical structure of lakes will be related to lake chemistry and ecology. Management of freshwater systems will be discussed in light of the preceding knowledge of lake and stream ecology. After completion of the course students will be competent to critically evaluate data on freshwater systems and to understand the relationship between physics, chemistry, and ecology in freshwater systems. This course provides the basis for EVPP 645: Freshwater Ecology and for research in freshwater ecology.

Course Content and Instructional Methods: The subject matter of this course is delivered in the form of lectures, lecture outlines, and assigned readings.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Text Reading</th>
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<tbody>
<tr>
<td>Aug 28</td>
<td>Introduction to the Waterscape, Properties of Water</td>
<td>26-33</td>
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<tr>
<td>Sept 4</td>
<td>Hydrology, Fluvial Geomorphology, Physical Structure of Streams and their Sediments</td>
<td>358-364</td>
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<tr>
<td>Sept 11</td>
<td>Physico-chemistry of Streams: temp, oxygen, carb.-bicarb. equilibrium, pH, hardness, nitrogen, phosphorus</td>
<td>364-370</td>
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<td>Sept 18</td>
<td>Overview of Stream Food Webs: autochthonous vs. allochthonous, CPOM vs. FPOM, etc.</td>
<td>370-383, 356-357</td>
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<tr>
<td>Sept 25</td>
<td>Linkage between Streams, their Watersheds, and their Floodplains Role of Fish in Stream Food Webs</td>
<td>384-407</td>
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<td>Oct 2</td>
<td>1st Exam, covers Stream Ecology</td>
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<td>Oct 9</td>
<td>Origins of Lakes, Lake Morphometry, Residence Times</td>
<td>457-464, 476-485, 14-17</td>
</tr>
<tr>
<td>Oct 16</td>
<td>Light, heat, and physical structure of lakes</td>
<td>17-19, 33-77, 82-99</td>
</tr>
</tbody>
</table>
Oct 23 Physico-chemistry of Lakes: temp, oxygen, carb.-bicarb. equil., pH, hardness, nitrogen, phosphorus 100-192

Oct 30 Overview of Lake Food Webs, Phytoplankton 333-355,226-264

Nov 6 2nd Exam, covers Lake Ecology through Physico-chemistry

Nov 13 Zooplankton, Benthic and Littoral Food Webs 265-298

Nov 20 Role of Fish in Lake Ecology 229-332

Dec 4 Management of Freshwater Ecosystems: Point and Nonpoint Pollution Control, Bioassessment, Restoration 499-520,464-475

Final: Dec. 11, 7:30-10:15 in regular classroom.

Textbooks:

Methods of Evaluation:
Grading: 1st Exam 100 pts
2nd Exam 100 pts
Final: 3rd Exam 100 pts
Cumulative 70 pts
Problem Sets 30 pts

In lieu of cumulative final, students may write a research paper of at least 20 pages (double-spaced) utilizing at least 20 references of which 10 must be journal articles. Students seeking to substitute the research paper must submit a 1 page written proposal to the instructor by October 30. This proposal should include title, outline of paper and at least 5 citations to be used in the paper. The proposal will be reviewed and returned to the student within 1 week. Those not submitting a proposal by October 30 must take the cumulative final.

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