Course Description
This course will introduce students to real-world examples of how GIS can be used to investigate and resolve water-resource issues. Topics will vary from general hydrologic modeling to specific case studies that examine watershed characterization, bathymetric modeling, and even riparian buffer analysis using LiDAR point cloud data. The emphasis of this course is to develop useful analytical GIS skills while examining the natural world around you. It is highly recommended you complete GEOG380, GEOG4/588, and GEOG4/592 before taking this course.

Instructor
Steven Sobieszczyk
2130 SW 5th Avenue
ssobie@pdx.edu
(503) 251-3208

Office hours: Th 4:30-5:30PM, or by appointment

Required Readings
- Journal articles – will be supplied by instructor
- ESRI ArcGIS Desktop Help: Hydrology Tools

Recommended Readings

Grading
Grades for the course include term project (Proposal, Annotated Bibliography, Report, Presentation) [50%], weekly labs and assignments [50% for undergrad, 40% for grad], and article reviews/presentations [10% - graduate students only]. Since research works best if others can understand it, labs and projects (report and presentation) will be graded on accuracy, completeness, and design.

Student Responsibilities
Attendance is required. Students are expected to engage in weekly readings and discussions and to write and present a research project.
**Term Project**

All research starts with an idea. This idea needs to be clear, concise, and compelling. Before a scientist can complete a report, or a student can write a term paper, ideas must be flushed out and developed. Students will have the option of choosing an established topic or choosing their own to complete a term project. The term project will be divided into four parts: proposal, annotated outline, presentation, and final report. Term projects can be completed with groups of no more than 3 people (both undergraduate and graduates). More details to follow.

- **Project Proposal** – Due *April 23, 2013*
- **Annotated Bibliography** – Due *May 21, 2013*
- **Presentation** – Due *June 4, 2013*
- **Report** – Due *June 11, 2013*

**Labs**

Lab exercises are designed for you to develop skills using ArcGIS Arc Hydro Tools and to apply the fundamental course concepts to real-world water resource data. Lab exercises are **DUE by the beginning of the next lab period (Thursday, 6pm)**. Any late lab reports submitted after 6pm are deemed *late* and will be docked 10%. For each day (24 hrs) the lab is late, I will deduct an additional 10%, including weekends. For example, turn it in Monday and you’re already down 40% without having the assignment even graded yet. Labs submitted over a week late will receive a 0%.

The computer lab, Cramer 469, is open for 24 hours seven days a week. You might need to call a security to get in the main building, if the main building door is locked. It is okay to work with a partner, or in groups, however each student is responsible for submitting their own lab report. Please see me *prior* to due date, if there is a scheduling conflict.

Please email a Word document.

**Assignments**

Class exercises are designed for you to further develop your GIS skills, while familiarizing yourself with ArcGIS. There should be enough time during class to finish the class assignments, however, if necessary, they are not **DUE until the beginning of the next lecture period (Tuesday, 6pm)**. Any late class assignments submitted after 6pm are deemed *late* and will be docked 10%. For each day (24 hrs) the assignment is not turned in, I will deduct an additional 10%, including weekends. For example, turn it in Thursday and you’re already down 20% without having the assignment even graded yet. If it's not turned in by the weekend after it was due, you will receive a 0%. Please make every effort to not submit late assignments.

Please email a Word document.
Graduate Students
Article Review - Written
Please submit a double-spaced, 12 font, 1 inch margin, 2-3 page limit write-up of the article you choose. Please keep to these specifications. Reports that are too short (less than 1.5 pages) or too long (exceeding 2 pages) will be docked points. An example write-up will be supplied. Write-ups are DUE at the beginning of the class period in which you present the material (Tuesday, 6pm). No late submissions will be accepted. I have high standards for graduate students and expect timely submission of materials and the ability to follow directions to be suitable expectations for those seeking higher-level degrees.

Please email a Word document. Article review is waived for undergraduate students.

Components I expect in a review:

1) Appropriate citation (see bibliography examples)

2) Problem statement
   - What question(s) do(es) the author(s) try to answer? What are the hypotheses?
   - What goals and objectives are found in the article?
   - Is this an important or a novel question?

3) Data/ Methods
   - What kinds of data were used? Did the author(s) collect the data?
   - What methods (e.g., statistical or GIS) were used?

4) Results
   - What are the findings of the article? – What is most surprising?

5) Your own evaluation of the article. This is the key component to focus your write-up on.
   - Did the author(s) answer the hypotheses?
   - Were the data enough to support the hypotheses?
   - Was the method employed appropriate to answer the research questions?
   - What do you find most interesting about the article?
   - What remains unanswered?
   - Would you like to replicate some of the approaches adopted in the article? If not, how would you like to approach differently?

Article Review – Presentation
• Group of 1-3 graduate students.
• Must submit 4-6 discussion questions by 6pm, Monday, prior to the Tuesday class in which you present.
• 10-15 minute presentation, plus discussion
## Tentative lecture schedule (subject to change)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Labs</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/02 – 04/04</td>
<td>Syllabus</td>
<td>Lab 1 – Intro to GIS</td>
<td></td>
</tr>
<tr>
<td>04/09 – 04/11</td>
<td>In-class Assignment (Groundwater)</td>
<td>Lab 2 – 3D Analyst</td>
<td>Lab 1 Due</td>
</tr>
<tr>
<td>04/16 – 04/18</td>
<td>Water Quality</td>
<td>Lab 3 – Arc Hydro Tools</td>
<td>Lab 2 Due</td>
</tr>
<tr>
<td>04/23 – 04/25</td>
<td>Arc Hydro Tools</td>
<td>Lab 3 – Arc Hydro Tools (cont.)</td>
<td>Proposal Due (4/23)</td>
</tr>
<tr>
<td>04/30 – 05/02</td>
<td>In-class Assignment (Watersheds)</td>
<td>Lab 4 – Water Use</td>
<td>Lab 3 Due</td>
</tr>
<tr>
<td>05/07 – 05/09</td>
<td>Water Use</td>
<td>Lab 5 – Bathymetry</td>
<td>Lab 4 Due</td>
</tr>
<tr>
<td>05/14 – 05/16</td>
<td>Interpolation / Rainfall</td>
<td>Lab 6 – Rainfall Estimates</td>
<td>Lab 5 Due</td>
</tr>
<tr>
<td>05/21 – 05/23</td>
<td>Wetlands / Riparian</td>
<td>Lab 7 – Riparian Buffers</td>
<td>Lab 6 Due</td>
</tr>
<tr>
<td>05/28 – 05/30</td>
<td>Water Awareness</td>
<td>Open Lab</td>
<td>Lab 7 Due</td>
</tr>
<tr>
<td>06/04 – 06/06</td>
<td>Student presentations</td>
<td>Student presentations</td>
<td>Presentations Due (6/4)</td>
</tr>
<tr>
<td>06/11 (Tue) 19:20-21:00</td>
<td>Student presentations</td>
<td></td>
<td>Report Due (6/11)</td>
</tr>
</tbody>
</table>