GEOGRAPHY 408: 
Watershed Analysis 

Fall 2015 

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Course Description: Systematic analysis of the fluvial dynamics of watersheds and the impact of humans on these dynamics. The course will emphasize the importance of geomorphological processes in watershed management. Class discussion and a class project will focus on a practical watershed assessment problem. 

Readings: There is no text for the course. Assigned readings are listed below and will be distributed electronically via Compass. 

Format: Two 75-minute lecture/discussion periods per week. 

<table>
<thead>
<tr>
<th>Points</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>20</td>
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<tr>
<td>Evaluation 1</td>
<td>25</td>
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<td>Evaluation 2</td>
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<tr>
<td>Oral Presentations</td>
<td>20</td>
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<td>Final Project</td>
<td>25</td>
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Class Project: A major component of the course will be conducting analysis of a component of a watershed system. The purpose of the project is to contribute to and help guide ongoing watershed research aimed at informing management activities. The project will also provide you with the opportunity to apply the concepts covered in class and in the readings to a "real-world" problem. You will be responsible (with my help of course) for designing and executing the projects. The class will work in teams, but I expect each student to contribute substantively to the team effort. Your individual grade for the project will be based on: a) your contribution to a written report on the project, b) the quality of an oral presentation on your findings, and c) an evaluation of your performance by other members of the project team. 
Schedule

Week 1  Aug. 24 & 26

Introductions, Purpose of Course, Critical Zone Research and the IML-CZO

Reading:  NSF Proposal for a Critical Zone Observatory inn Intensively Managed Landscapes

Week 2  Aug. 31 & Sept. 2

Past Class Projects, Overview of Ongoing Research in the IML-CZO

Reading:  Class Report for 2013 class

Week 3  Sept 9

Watersheds: Scale, Hydrological, Geomorphological Characteristics


Week 4  Sept. 14 and 16

Watersheds and Water Quality


Week 5  Sept. 21 and 23

Watersheds and Sediment Dynamics


Week 6  Sept. 28 and Sept. 30

Human Impacts on River Systems: Watershed-scale Impacts

**Week 7 Oct. 5 & 7**

Human Impacts on River Systems: Channel-scale Impacts


**Week 8 Oct. 12 & 14**

Geomorphology and Aquatic Ecology


**Week 9 Oct. 19 and 21**

Geomorphology, Riparian Ecology and LWD


**Week 10 Oct. 26 and 28**

Impact of Dams and Dam Removal


**Week 11: Nov. 2 and 4**

River Restoration: Natural Channel Design and Stream Mitigation

Week 12 Nov. 9 and 11

River Restoration: Process-based Approaches

Reading: Roni, P. and Beechie, T. 2013. Introduction to restoration: Key steps for designing effective programs and projects. IN Stream and Watershed Restoration, Wiley and Sons, pp. 18-29

Week 13 Nov. 16 & 18

Stream Naturalization


Week 14 Nov. 30 & Dec. 2

In-class project meetings

Week 15 Dec. 7 & 9

Oral Project Presentations