ENR 3285-Level: Watershed Hydrology 3 Credits

INSTRUCTOR & CONTACT INFORMATION:
Dr. Kristin Jaeger
Office: 132 Williams Hall, OARDC Wooster
Office hours: Thursday 2pm- 4pm, 359 Kottman Hall or by appointment
Email: jaeger.48@osu.edu

OBJECTIVES
The overall course objective is to develop an understanding of how water moves through our landscape. Students will be introduced to the hydrologic processes occurring within a watershed and evaluate how the complex combination of watershed characteristics, climate, and land use practices influence these processes. In addition, we will explore approaches on how to address pertinent watershed management issues.

Specific Goals:
1. Develop a comprehension of the different components of the hydrologic cycle.
2. Explore the influences of climate and land use on hydrologic processes.
3. Evaluate hydrologic processes through field measurements and analytical computation.
4. Develop learning, problem-solving, and communication skills

This course has no prerequisites, but it is highly quantitative and will require basic algebra skills.

COURSE SCHEDULE & MEETING TIMES:
Lecture: Thursdays 5:30-7:30 pm at the Scheirmeier Wetland Research Park
Labs: Fridays 9 am-12 pm at the Scheirmeier Wetland Research Park.
*NOTE – There are two lab sections, each section will meet every other week.

COURSE MATERIALS:
4. Journal article readings will be posted on Carmen as pdf’s.
5. Carmen will be used extensively throughout the class to post readings, updates and reminders. Homework problem sets will also be posted on Carmen.

GRADING
Literature review & presentation: 10%
Midterm exam: 15%
Final exam: 20%
Homework problem sets 25%
Lab write-ups/reports: 20%
Participation and attitude 10%

ENR 3285 Watershed Hydrology
Spring 2014
PREPARATION FOR LECTURE
You are expected to have read and be familiar with the material to be covered in lecture when you come to class. Please read assigned readings, as the lectures will build on this material.

EXAMS
The mid-term exam will be an in-class exam. Final exam will be take-home.

SHORT PRESENTATION ON LITERATURE (BASED ON FORMAT IN DR. MAZEKA SULLIVAN’S STREAM ECOLOGY COURSE)
A student group of 2 will prepare a short handout (1-2 pages) and prepare a short presentation on either a review or research paper that will be assigned to you at the beginning of the semester. The following guidelines provide a general template for review, write-up and presentation/discussion (< 10 min/paper) of assigned articles.

Outline for Class Handout:
I) Definitions: Write down technical terms that are new to you in the assigned paper. (Define these terms prior to arrival in class)
II) Summary: Write a short, objective summary of the paper. Do not evaluate the paper at this point, simply summarize in a few sentences its purpose, main findings and "take home" message.
III) Objectives: Explicitly state the objectives of the paper, as given by the author(s). What reasons are given to support the importance and/or relevance of the research objectives and/or findings?
IV) Methods: Are the methods used appropriate and adequate for the questions or hypotheses being addressed? Identify any methods that are not clearly presented or that you do not understand (applies to research papers only).
V) Results: Outline the main results presented in the paper. How do the results relate to the questions or hypotheses set forth in the objectives? Identify any unclear results.
VI) Discussion: (Here is where you should offer your personal evaluation of the paper.) How well does the discussion reflect the results? Are interpretations of the data presented in the results section justified, or to what extent are the interpretations and discussion speculative? Does the paper adequately represent both the strengths/weaknesses of the research findings?
VII) Overall: What do you consider as the main strengths of the paper? What are some weaknesses? What is interesting about the paper? What did you learn? What relevance does this paper have to issues or topics that have been discussed in class? What other areas of hydrologic research can you relate this paper to, either in terms of basic or applied science?

Class presentation/discussion:
Do not read your handout to the class. Prepare a power-point presentation containing key figures, photos of research area, researchers, etc. Focus your presentation (< 10 min) on research highlights (methods, results, discussion) & implications for future studies and tie the material in to class lectures. Be prepared for a brief discussion by bringing questions you can ask your classmates.

HOMEWORK PROBLEM SETS
Take-home problem sets are assigned to build your quantitative understanding of the physical processes in hydrology that integrates with concepts from the lecture. Problem sets are computational and will require a calculator and sometimes the use of excel or a comparative spreadsheet software. All work (i.e. calculations and sketches) should be submitted to get full credit. This will also allow me to give you appropriate credit even if some calculations are wrong.
Problems sets will be due at the \textit{beginning} of class, one week after they are assigned. You may work in groups, however, you are expected to turn in your own work and complete the assignment within the guidelines of the University’s Code of Student Conduct. Late assignments will not be accepted unless discussed previously with the instructor.

\textbf{ARTICLES}


## Tentative Schedule of Lectures, Labs, and Assignments

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Topic</th>
<th>Readings</th>
<th>Lab/Field Exercise</th>
<th>Homework Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-Jan</td>
<td>Lecture 1</td>
<td>Introduction</td>
<td>Brooks, Chapter 1</td>
<td>Computer Lab: Units, conversions, and significant figures, Statistical methods (Brooks Chapter 18), Microsoft Excel tutorial, on-line sources</td>
<td></td>
</tr>
<tr>
<td>16-Jan</td>
<td>Lecture 2</td>
<td>Precipitation</td>
<td>Brooks, Chapter 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-Jan</td>
<td>Lecture 3</td>
<td>Evapotranspiration and Soil Water Storage</td>
<td>Brook, Chapter 3</td>
<td>Computer Lab: Frequency Analysis</td>
<td>1</td>
</tr>
<tr>
<td>30-Jan</td>
<td>Lecture 4</td>
<td>Infiltration, Runoff, and Streamflow</td>
<td>Brooks, Chapter 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Feb</td>
<td>Lecture 5</td>
<td>Snow Hydrology</td>
<td>Brooks, Chapter 15</td>
<td>Field: Measuring infiltration rates</td>
<td></td>
</tr>
<tr>
<td>13-Feb</td>
<td>Lecture 6</td>
<td>Groundwater and Water Budgets</td>
<td>Brooks, Chapter 5</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>20-Feb</td>
<td>MidTerm Exam</td>
<td></td>
<td></td>
<td>NO LAB</td>
<td></td>
</tr>
<tr>
<td>27-Feb</td>
<td>Lecture 7</td>
<td>Vegetation Management, Water Yield, and Streamflow Pattern</td>
<td>Brooks, Chapter 6</td>
<td>Computer Lab: Hydrograph analyses</td>
<td></td>
</tr>
<tr>
<td>6-Mar</td>
<td>Lecture 8</td>
<td>Upland sediment processes</td>
<td>Brooks, Chapter 7</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>13-Mar</td>
<td>Lecture 9</td>
<td>Gully erosion, Sediment Yield, and Channel Processes</td>
<td>Brooks, Chapters 8 &amp; 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-Mar</td>
<td>Lecture 10</td>
<td>Stream Channel Morphology and Stream Classification</td>
<td>Brooks, Chapter 10</td>
<td>Field: Measuring stream flow, channel morphology classification</td>
<td>4</td>
</tr>
<tr>
<td>27-Mar</td>
<td>Lecture 11</td>
<td>Dryland hydrology</td>
<td>Baird and Wilby, Chapter 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Apr</td>
<td>Lecture 12</td>
<td>Water Quality</td>
<td>Brooks, Chapters 11 &amp; 12</td>
<td>Field: Water quality sampling</td>
<td></td>
</tr>
<tr>
<td>17-Apr</td>
<td>Lecture 13</td>
<td>Hydrologic Methods &amp; Tools for Analysis and Research</td>
<td>Brooks, Chapters 17 &amp; 18</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>24-Apr</td>
<td>Lecture 14</td>
<td>Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-May</td>
<td>Final Exam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACADEMIC MISCONDUCT
Academic integrity is essential in maintaining excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an “excuse” for academic misconduct. Please review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

DISABILITY
Students with disabilities that have been certified by the Office for Disabilities Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs.