WATS 3700  FUNDAMENTALS OF WATERSHED SCIENCE  Spring 2016

Instructor:  Dr. Patrick Belmont
            Office: NR 322
            Email: patrick.belmont@usu.edu
            Office hours: Wednesday 2:00 – 4:00 PM or by appointment

Co-instructor:  Sara Kelly
                Office: Janet Quinney Lawson (JQL), Room 222
                Email: sara.kelly@aggiemail.usu.edu
                Office hours: by appointment only

Lecturer:  Brian Laub
            Email: brian.laub@aggiemail.usu.edu

Lectures:  Monday, Wednesday, Friday 12:30 – 1:20 PM; ENG 106

Course Objectives:
The many demands on limited water supplies and the impact of human activities on water quality and freshwater ecosystems in the US and around the world require careful management of this resource. Watershed science is the emerging field that integrates understanding of the physical, chemical, biological, and ecological interactions that occur within drainage basins and measures the extent to which these interactions affect the quantity and quality of water and freshwater ecosystems.

The objective of this course is to introduce you to the concepts that define watershed science as a discipline and to familiarize you with the principles of watershed management. We will focus on a variety of topics that illustrate the interdisciplinary nature of watershed science. These include geography, climatology, hydrology, geomorphology, ecology, and limnology. The course is designed to accomplish several goals: (1) to help you develop a broad appreciation for current water-related issues facing society; (2) to provide you with the necessary conceptual background to understand basic processes related to environmental research and management, and (3) to provide you with the necessary analytical foundation for advanced coursework in watershed science and hydrology.

Required Materials:
The vast majority of required readings are available online, with most derived from primary literature as well as an open, online course (Water: Science and Society) that the instructors recently developed in collaboration with faculty from Penn State. The course website for WSS can be found here: https://www.e-education.psu.edu/earth111/

We will also utilize readings from The West Without Water (WWW) to illustrate some of the concepts we discuss in class with regionally relevant examples. I recommend that you purchase the book, but it is available as an Ebook from the Merrill-Cazier Library website and I have several hard copies to loan out on a first-come-first-served basis.


We will also utilize two chapters from Freshwater Ecology, also available as an Ebook from the Merrill-Cazier Library:


Canvas
We will use Canvas regularly for sharing announcements, accessing readings, accessing assignments, and checking your grades. The messaging system in Canvas is inflexible and clunky, so do not use it to contact me. Email me directly if you have questions or concerns.

Assignments and grading:
The final grade will be based on the total number of points scored out of the total possible in each of the following categories:
Participation = 5%
Formal Writing Assignments = 25%
Other Formative Assignments and Summative Assessments = 35%
Midterms and Quizzes = 20%
Final Paper = 15%

Homework Assignments: Throughout the semester a number of problem sets will be assigned to familiarize you with some of the basic principles and methods used in watershed science. Unless exercises are designated as group projects, students should submit their individual effort.

Midterms: There will be two midterm exams to assess your knowledge of the assigned readings and the material presented during lecture. Quizzes can be announced or unannounced and will be used as needed. All quizzes and tests are closed book unless otherwise stated - no notes, books, cell phones, palm pilots, headphone or any other materials are allowed. If you are an ESL student, please contact me to make arrangements for use of foreign language dictionaries and translators. You must have prior permission to use such a device.

Writing Assignments: This is a communication intensive (CI) course. You will be asked to submit short writing assignments throughout the course and a final paper at the end of the course. Most short writing assignments will be peer-reviewed and graded by the instructors in cursory fashion (i.e., you won’t get a lot of feedback…there’s too many of you and too many assignments!). Formal writing assignments will be more rigorously graded and thorough feedback will be provided. You will be expected follow a set of guidelines regarding content and format that will be provided to you.

Writing Fellows Program: To help students improve their writing skills, this class has been selected to participate in the Writing Fellows (WF) Program. For two formal writing assignments, you will submit a good first draft that will be evaluated by the WF; you will then meet in a conference with the WF to discuss possible improvements of your paper and suggestions for revision; you will submit the original draft (with WF’s comments) and the final version of your paper to the instructor for grading. Final papers will not be accepted without the first draft and WF comments. There are two due dates for each paper: first draft to the WF and final version to the instructor. Please note time and place of your conference and honor your appointment. Students that fail to show up for their appointments with the WF will be marked down. Both first and final drafts must be submitted at the beginning of class on the specified.
The four Writing Fellows for our class are:

Sydney Sneddon email: sydpsneddon@aggiemail.usu.edu
Regan Blanc email: regan.powell21@gmail.com
Kelsie Johnson email: kelse.johnson@aggiemail.usu.edu
Cody Hammons email: seamus.hammons@gmail.com
Course Policies:
Arrive on time and depart when class is dismissed. If you have extenuating circumstances that prevent you from doing so, please let me know before class.

Homeworks and papers (original and final drafts) are due at beginning of class period on the assigned due date: points will be taken off (10% per day) for late submissions of homeworks and papers. Students unable to attend the midterm exams at the scheduled times must contact me at least one week prior to the exam (preferably earlier). Arrangements for make-up exam will only be made as an emergency measure for justifiable reasons.

Cell phones: You may use the calculator on your cell phone, but you will need a regular calculator for exams, so I suggest ‘practicing’ with the calculator you plan to use for exams. Except for occasional calculations, keep cell phones off during class.

Departmental and University Policies:
Academic Freedom
Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility.

Students with Disabilities
Accommodations are collaborative efforts between students, faculty and the Disability Resource Center (DRC). Students with accommodations approved through DRC are responsible for contacting me prior to or during the first week of the semester to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DRC should contact DRC immediately at 797-2444.

Academic Dishonesty
All assignments and exams are to be completed individually, unless otherwise stated by the instructor. This course follows the University rules on civility and honesty. These can be found at http://www.usu.edu/policies/PDF/Acad-Integrity.pdf. The penalty for cheating, falsification, or plagiarism in this class will be assessed on a case-by-case basis, but by default will be a zero grade for the assignment/exam. In addition, the offense will be reported to the Office of Student Conduct for inclusion in the student’s permanent record.

Important Dates:

Writing Assignment 1 Due: Friday, 12 February 2016 @ beginning of class  
Midterm 1: Wednesday, 2 March 2016 @ 12:30 PM (50 min)  
Writing Assignment 2 Due: Friday, 4 March 2016 @ beginning of class  
Midterm 2: Friday, 22 April 2016 @ 12:30 PM (50 min)  
Final Paper Due: Monday, 2 May 2016 @ 11:30 AM

WSS: Water, Science and Society online course modules: https://www.e-education.psu.edu/earth111/node/511  
WWW: The West Without Water  
FE: Freshwater Ecology
<table>
<thead>
<tr>
<th>Month</th>
<th>Dates</th>
<th>Topic</th>
<th>Reading</th>
<th>Assignments*</th>
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<tbody>
<tr>
<td>JAN</td>
<td>11, 13, 15</td>
<td>Intro to Watershed Sciences, Distribution of water on Earth</td>
<td>WSS Module 1</td>
<td>Units &amp; Sig digs</td>
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<td></td>
<td>20, 22</td>
<td>Climatology</td>
<td>WSS Module 2</td>
<td>Water journal, WSS M2: FA 2&amp;3</td>
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<td>25, 27, 29</td>
<td>Climatology and Climate Change</td>
<td>WSS Module 8.2, WWW p1-60</td>
<td>WSS M2: Sum WA 1</td>
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<tr>
<td>FEB</td>
<td>1, 3, 5</td>
<td>Rivers and watersheds</td>
<td>WSS Module 3</td>
<td>WA 1 Topo maps</td>
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<td>8, 10, 12</td>
<td>Flood and drought</td>
<td>WSS Module 4</td>
<td>WA 1 WSS M4: FA 3 Flood news</td>
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<td>16, 17, 19</td>
<td>Stream channel processes</td>
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<td>WSS M4: Sum</td>
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<td>22, 24, 26</td>
<td>Dams</td>
<td>WSS Module 5, WWW p173-189</td>
<td>WSS M5: FA 3 WA 2, Dam debate</td>
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<td>MAR</td>
<td>29, 2, 4</td>
<td>Pre-midterm review, Midterm, Post-midterm review</td>
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<td>WA 2 Study!</td>
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<td>7-11</td>
<td>Spring Break</td>
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<td>Party! And relax.</td>
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<td>14, 16, 18</td>
<td>Lakes and wetlands</td>
<td>FE Ch 6</td>
<td>Wetland news</td>
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<td>21, 23, 25</td>
<td>Groundwater</td>
<td>WSS Module 6</td>
<td>WSS M6: Sum</td>
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<td>APR</td>
<td>28, 30, 1</td>
<td>Groundwater, Water quality</td>
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<td>Groundwater news</td>
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<td>4, 6, 8</td>
<td>Water quality</td>
<td>WSS Module 7</td>
<td>WSS M7: Sum</td>
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<td>11, 13, 15</td>
<td>Trophic levels and interactions, Fish ecology</td>
<td>FE Ch 21</td>
<td>Fish news</td>
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<td>18, 20, 22</td>
<td>Fish ecology, Midterm 2</td>
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<td>Study!</td>
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<td>25, 27, 29</td>
<td>Watershed and Stream Restoration</td>
<td>WWW p190-222</td>
<td>Final paper</td>
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