# WR/GR 304: Sustainable Watersheds
Spring 2017 Syllabus
Class times:  TR 2:00-3:15 pm in Eddy 212

**Instructors:**
Stephanie Kampf
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Office hours:  Monday 1-2 pm; Friday 2-3 pm

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**TAs:**
Caroline Martin
Email: Caroline.Martin@colostate.edu; Office: NESB A115
Office hours: Monday 2-3 pm; Thursday 8:30-9:30 am

Ben Robinson
Email: Benjamin.Robinson@colostate.edu; Office: NESB A105
Office hours: Tuesday/Thursday 3:30-4:30 pm

**Course overview and objectives:**
This course is designed to introduce students to watershed science, management, and sustainability concepts.  The course will define what is meant by the terms watershed health and watershed sustainability and cover the physical, chemical, biological, ecological, and social factors that affect watersheds, water resources, and their sustainability.

The course objectives are to:
1. Develop an understanding of the factors that affect the quantity and quality of water within a watershed.
2. Build skills in collecting, analyzing, and critically evaluating watershed data and documents from multiple sources.
3. Learn science-based strategies for evaluating how human activities affect watershed and water resource sustainability and for proposing management actions.

**Course materials:**

1. **iClicke**r (required). You MUST bring the iClicker to every class lecture starting Tuesday Jan 24. iClicker is a response system that allows you to answer questions during class and receive credit for participation. To receive credit, you will need to register your iClicker remote online within the first week of class at the following web site:  https://wsnet.colostate.edu/cwis262/clicker/registration.aspx

Login with your eName and password. In the iClicker ID field, enter your remote ID and select the "Register" button. The remote ID is the number found on the back of your iClicker remote.

2. **Textbook** (recommended):  Holden (Ed.): Water Resources, An Integrated Approach. Routledge New York, New York. The text is available in the bookstore or online through the library's website as an e-book.

Additional course materials will be posted on Canvas, and look on Canvas to find complete reading list for each class session. iClicker quizzes may cover any materials on the reading list.


**Expectations:**
*Attendance:*  Students are responsible for attending all classes, and both attendance and class participation are critical to success in this class.  To make up participation points or other graded activities in a class that was missed, students must have an excused absence that is approved by the Instructors or Teaching Assistants. All excused absences will be handled by Ben Robinson.

*Assignments:*  All assignments are due online by Friday at 5pm on the week the assignment is posted on the syllabus.  To avoid losing points on late assignments, you must request an extension at least 24 hours before the assignment is due. Extensions may or may not be granted and will be decided by the Teaching Assistant in charge of that week's assignment. Late assignments lose 10% of the assignment grade per week after the assignment due date, up to a maximum point loss of 50%.

*Academic integrity:*  Students are responsible for adhering to all university policies on academic integrity (http://learning.colostate.edu/integrity/index.cfm) and student conduct (http://www.conflictresolution.colostate.edu/conduct-code#conduct).

**Course outline (subject to change)**:

| Week | Tuesday | Thursday |
|---|---|---|
| Jan 17 | Introduction to class<br>*Read Holden Ch. 1* | Watershed delineation (Freddy Saavedra)<br>    HW1: Pick a watershed |
| Jan 24 | Precipitation<br>*Read Holden Ch. 2* | Evapotranspiration<br>    *Read 2 articles for HW2*<br>    HW2: Writing analysis |
| Jan 31 | Infiltration and runoff<br>*Read Holden Ch. 3* | Subsurface storage and flow<br>    *Read Holden Ch. 5, Glennon Ch.3*<br>    HW3: Discharge data |
| Feb 7 | (Erin, Peace Corps) Water supply and demand<br>*Read Holden Ch. 7* | Water infrastructure<br>    *Read MacDonnell Ch.19-20*<br>    HW4: Reservoir storage |
| Feb 14 | Cache la Poudre water system (Jared Heath) | Erosion and sedimentation<br>    *Read MacDonnell Ch.21-24*<br>    HW5: Hydrograph change from dam |
| Feb 21 | Channel geomorphology (Dan Scott)<br>*Read Stream Restoration Ch. 1* | Watershed management |
| Feb 28 | Riparian vegetation (Andrea Borkenhagen)<br>*Read Stream Restoration Ch. 8* | Stream corridor restoration (Eric Richer)<br><br>    HW6: Channel changes |
| Mar 7 | Review | Midterm |
| *Spring Break* | | |
| Mar 21 | Water quality | Water and human health: pathogens, pesticides and heavy metals<br>    HW7 |
| Mar 28 | Aquatic ecosystems: physical, chemical structure | Aquatic ecosystems: biology, microbiology and biogeochemistry<br>    HW8 |
| Apr 4 | Lotic ecosystems: streams and rivers | Lentic ecosystems: ponds, lakes, wetlands and reservoirs<br>    HW9 |
| Apr 11 | Water treatment | Watershed health and sustainability<br>    HW10 |
| Apr 18 | Water law and policy | Ecosystem services<br>    HW11 |
| Apr 25 | TBD | TBD<br>    HW12 |
| May 2 | Summary Lecture | Review for Final Exam |
| *Final* Tuesday May 9th, 2017 2:00 – 4:00 PM | | |

**Grading:**
Students will be evaluated based on assignments, exams, quizzes, and participation in class activities. Assignments are designed to increase understanding of local and international watershed issues, develop data collection and analysis skills, critically evaluate readings, and develop technical writing and presentation skills. Exams will test for conceptual understanding of class topics and for ability to apply skills developed through assignments and class activities. The distribution of course grades is:

| | |
|---|---|
| Assignments: | 50% |
| Midterm exam: | 20% |
| Final exam: | 20% |
| Class participation: | 10% |

Extra credit: A number of watershed-related events will be held on campus this semester. If you attend one of these events and write up a paragraph summary, you can earn 5 extra credit points per event attended, up to a maximum of 15 total extra credit points. These events will be announced in class.

Course grades will be based on the following scale:

| A+ | ≥98% | B+ | ≥88% | C | ≥70% |
|---|---|---|---|---|---|
| A | ≥92% | B | ≥82% | D | ≥60% |
| A- | ≥90% | B- | ≥80% | F | <60% |