Welcome to the world of computer-facilitated, distant delivery, and Stream-Side studies of Water Quality. This Stream Side Science course will study quantifiable aspects of ‘fresh’ water systems using classroom (internet) and field studies. The course is an 8 week, 3-credit course offered through the Department of Land Resources and Environmental Sciences and the College of Graduate Studies at Montana State University.

Title: Stream Side Science (SSS)

No. of Credits: 3 graduate credits, LRES 591, Montana State University

Course Length: 8-weeks (mid-June through August)

Instructor
Amber Kirkpatrick, MS Montana State University

COURSE OBJECTIVES

1. Our first and foremost objective is to provide hands-on experience in monitoring water quality and evaluating water resource characteristics in a format appropriate for use in the classroom to stimulate students to investigate water resources in their environments. Your first assignment is to find a local stream that you can use for the duration of the course.

2. Learn about the most significant (and interesting) water quality and water resource properties (physical, chemical, hydrological, biological) and how to integrate these measurements into a Water Quality Index (WQI).

3. Expose teachers to the many different resources for teaching water quality as a lab-based, hands-on study program and develop a reference library of resources, experiments, demonstrations, and activities to aid in understanding the importance of water resources in everyday lives.

4. Understand how water quality and water resource properties interact to affect the quality of our environment and how ‘water resources’ as identifiable units are components of the landscape ecosystem and its processes.

5. Have FUN while safely experiencing stream side water quality and water quality monitoring.

With specific attention to the National Science Education Standards, the approach is to enhance learning through inquiry, investigation, and analysis using collaborative learning through team work and sharing of learning experiences. The following instructional pedagogies are integrated into the class:

1. Inquiry
2. Hands-on active learning
3. Multi-sensory methods of learning
4. Student-to-student interaction
5. Discourse and reflective thinking
6. Readings and research

Each week's work will include text and on-line reading assignments, streamside activities, participation and exchange in on-line discussions, written homework assignments and supplemental resources. Students will be
required to complete weekly assignments, assessments, a two-part online final exam, and respond to the D2L post-course evaluation.

COURSE EXPECTATIONS

One of the things we have noticed about teaching non-traditional, online courses is that due to the nature of where we all are in our lives - LIFE HAPPENS! Just when you think you have it all under control WHAM! Something happens to either put a complete stop to your progress or detour you a bit. Our job is to help you get through this course successfully while navigating the unexpected roadblocks of life. So, to help assure class goes smoothly, please try to stick by some basic requests.

- This is a hands-on, field based course and it requires you to be on-stream taking measurements and collecting samples. The majority of your assignments will be completed on a stream you choose in week one, so please do not plan to be gone for more than a week during the course. With that said..... **IF YOU KNOW THERE ARE MORE THAN 7 DAYS OF CLASS YOU MUST MISS LET AMBER KNOW BEFORE YOU REGISTER FOR THIS COURSE!** That way we have time to work something out. However, we understand that things happen and if we need to work around unexpected bumps - we will.
- You must have access to a scale that measures to milligrams (mg) for week 5.
- You will also need a digital camera distilled H2O, internet and at least a working knowledge of excel or some sort of electronic spreadsheet for the duration of the course.
- Complete assignments by the due date. If something unexpected does occur, CONTACT AMBER IMMEDIATELY and we will work something out. If you don't let us know something will be late you will lose 5% per day.
- Please use proper grammar and spelling – This is a graduate level course and you are expected to submit a graduate level quality of writing.
- Be respectful to your classmates during discussions.
- When submitting homework: In the D2L Dropbox, please include your name on the file extension such as: "AmberK loadingup.doc", and include your name at the top of each document so we see it when we open the file.

COURSE MATERIALS

About a week prior to class starting, you will receive a supply box with all the specialized supplies and necessary reagents for water quality testing that we will be working with in this course. We will be using a variety of tools including: single and multi-parameter test strips, Hach and CHEMetrics Single Parameter Test Kits, CHEMetrics titration kits, Micrology Labs Coliscan Easygel media, and pH meter with calibration solutions.

COURSE DISCUSSIONS

It is important to emphasize how the required and optional discussions will work throughout the course. We will have at least four required discussions you will be asked to participate in throughout the course. The purpose of these discussions is to facilitate valuable input on the topics we place in front of you and provide an opportunity to exchange ideas and thoughts with your classmates. In order to make these "conversations" evolve, you are required to post your first response to the discussion topic by Wednesday night and then respond to at least two of your classmates input. You must have all of your additional input posted by midnight Sunday - the end of that week. Thus, Thursday through Sunday the group can respond to any input posted on or
before Wednesday evening. This encourages an active discourse on the discussion topics and promotes each individual to become involved in the process.

**COURSE SCHEDULE**

Websites will begin Saturday by noon MT and end the following Sunday at midnight MT. Click here for a Time Zone Converter.

<table>
<thead>
<tr>
<th>SATURDAY</th>
<th>SUNDAY</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
<th>SATURDAY</th>
<th>SUNDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week A module opens NOON Mountain Time</td>
<td>First Discussion posting due Midnight Mountain Time</td>
<td></td>
<td>Week B module opens NOON Mountain Time</td>
<td></td>
<td>Week A assignments due Midnight Mountain Time</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GRADING**

We will be checking in on class daily. We will gather homework, remind folks of missing homework, keep a tally and record sheet of grades, and post back homework assignment answers.

You will be graded and assessed in the course in several ways:
- Discussions and Information Sharing Sessions - topics that expand on water quality issues.
- Homework assignments - at the desk.
- Stream Side (SS) field labs - on the stream.
- Final stream Water Quality Index.
- Final Evaluation.

The grading scale is based on a percentage score of total points for assignments and activities during the course, as follows:

- A+ = > 95% of total possible points
- A = 90-95% of total possible points
- B+ = 85-89.99% of total possible points
- B = 80-84.99% of total possible points
- C = 70-79.99% of total possible points
- D = 60-69.99% of total possible points
- F = < 60% of total possible points

All assessments, quizzes, and grades will be reported by student ID number. Final grades will be assigned two weeks after the last module; all assignments must be completed at the end of Week 8.

Due to the nature and pace of this course assignments must be completed on time. Therefore, late assignments will receive a 5% deduction per day **UNLESS PRIOR ARRANGEMENTS HAVE BEEN MADE**.
ABOUT THE TEXTS

This course is organized around two nationally recognized textbooks which focus on actual water quality monitoring techniques, data collection, data analyses and interpretation.


- Online only: **Stream Side Science** (by Nancy Mesner, Utah State University): You will need to copy and paste into your web browser: https://extension.usu.edu/waterquality/htm/educator-resources/stream-side-science/sss-lesson-manual/

- **Save Our Streams-Monitor’s Guide to Aquatic Macroinvertebrates**: This 64-page fully illustrated guide is designed to enable anyone to identify aquatic insects and crustaceans. It includes a dichotomous key, detailed description of each organism, and tips for proper identification. A handy resource for anglers, students, biologists, or anyone else spending time near rivers and streams. Available through McDonald and Woodward Publishing Company.