Frshwtr 513 Field Experimentation and Analysis in Freshwater Sciences
Fall Semester 2018
Syllabus
3 credits U/G
Prereq: BioSci 152, Chem 104 or equivalents; graduate standing)

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School of Freshwater Sciences
Class location: SFS, room 1084
Lc/La: 8-week session. Regular meeting day Thursday 12:30PM – 3:30PM with arranged added times for field trips – see schedule below)
Office Hours: by appointment; call, email, contact during class, visit office (Kaster-3033, Klump-3075)

Class Description: Essentials of Field Experimentation and Analysis in Freshwater Systems
Field work will be required in addition to the scheduled lecture/lab for this course. For overnight field trips (weeks 1 and 4), students are required to bring their own camping gear (tent (week 1 only), sleeping gear, field clothing, rain gear, closed toe shoes, etc.) and pay for their own personal expenses. Note that camping fees, Kemp Field Station lodging, and group style meals will be paid by SFS on the field trips. Gear rental is offered for segregated fee-paying students currently enrolled at UWM (uwm.edu/urec/outdoor-pursuits/gear-rental/). This class will meet at the School of Freshwater Sciences, 600 E Greenfield Avenue, Milwaukee, WI 53204.

Course Objective: Student acquisition of comprehensive investigative procedures in freshwater ecology focusing on field and laboratory interactive assignments.

Learning Objectives: In the field of freshwater ecology, students will:
1. Demonstrate fundamental scientific concepts, terminology, and theories and integrate this knowledge into larger contexts and field applications.
2. Understand and be able to perform the procedures for conducting scientific inquiries including observation, consider innovative hypothetical situations, hypothesis testing, data collection and quantitative analysis.
3. Use the procedures (including study design, appropriate and varied laboratory and field methods, and quantitative analysis) and reasoning processes of science to develop and evaluate investigative evidence critically. Many tools will be used as time allows, including benthos methods, meiofauna, hypoxia methods, slide prep methods, CTD, YSI, sondes, water bottles, plankton nets/traps, secchi, benthos corer; box corer, ponar, ekman, shipek, orange peel, benthic sled, video ray, drones, pore water, benthic respiration, gill nets, Surber sampler, PUF samplers, stream gauging, diversity and $1^\circ$, $2^\circ$ production.
4. Demonstrate competency in using research equipment, laboratory and field techniques, computer tools (including use of software programs for data analysis and presentation, numerical analysis, and/or model computer simulations) and be aware of emerging technologies and techniques.

5. Pass DNR boating safety requirements

Schedule

Week 1
Overnight Field Trip:
Sep 6 Field trip prep, 12:30pm-2:00pm; Departure to Potawatomi @ ~ 2:00pm. Set up camp, initiate experiments, and lay-of-the-land.
Sep 7 R/V Neeskay
Sep 8 R/V Neeskay
Sep 9 R/V Neeskay & Return to Milwaukee, arrive ca. 8:00pm

Week 2
Sep 13 Lab Day at SFS, 12:30pm-3:30pm

Week 3
Sep 20 Lab Day at SFS, 12:30pm-3:30pm

Week 4
Overnight Field Trip:
Sep 27 Thursday, Depart for Kemp Field Station 12:30pm - Sep 30 Sunday. Return to Milwaukee 7:00pm

Week 5
Oct 4 Lab Day at SFS, 12:30pm-3:30pm

Week 6
Oct 11 Beach Day, 12:30pm-5:30pm

Week 7
Oct 18 River Day, 12:30pm-5:30pm

Week 8
Oct 25 Lab Day at SFS, 12:30pm-3:30pm

Week 9
Nov 1 Report out exam at SFS, 12:30pm-3:30pm

Readings
Selected readings will be assigned depending on areas that require greater understanding beyond the field, lab and explanatory lectures or in areas that generated special interest. Access to all readings will be provided by the instructor. Additional literature may be added.

Eco-DAS VIII, IX, X Symposium Proceedings Editor: Paul F Kemp
E.g., Melissa M. Baustian, Gretchen J. A. Hansen, Anna de Kluijver, Kelly Robinson, Emily N. Henry, Lesley B. Knoll, Kevin C. Rose, and Cayelan C. Carey
Linking the bottom to the top in aquatic ecosystems: mechanisms and stressors of benthic-pelagic coupling. X, Chapter 3, p. 25-47. 2014


Spatial distribution of microphytobenthos, meiofauna and macrofauna in the north-western Adriatic Sea: a synoptic study. Annalisa Franzo, Tamara Cibic, Paola Del Negro, Cinzia De Vittor. *Advances in Oceanography and Limnology, 2015; Vol 6, No 1/2*

**Graduate Student Requirement**

Graduate students are required to complete the following assignments:
1. Students will lead a topical discussion on experimental design.
2. Prepare field trip staging logistics.
3. Submit a report on a topic provided by the instructor.
4. Maintain a lab/field log book, including electronic files, of all activities and data.

**Graduate Student Grading**

Graduate student grade will be based on the regular class assignments in the field and lab (see below) and additionally on each requirement above.

**Grading for all students**

The Report out exam (below) will be a combination of field note defense (25%), problem solving (both the thinking process and calculated answers (25%), participatory effort (25%), and presentation (25%)

**EXAM SCHEDULE**

Report out exam – assignment based (Nov 1)

**Course Load**

As a guideline, the amount of time that an average student should expect to spend on this class, in order to achieve the learning goals of the course, is given below.

Time in the field and lab: 64 hours minimum
Time taking exams: 3 hours
Time completing assignments: 30 hours
Time for preparation and study: 21 hours
Time spent reading other material: 25 hours

The total number of hours: 144 hours (48 hours/credit)
University Policies. Link to the Secretary of the University web site (http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf) that includes the following University policies:

1. **Students with disabilities.** Notice to these students should appear prominently in the syllabus so that special accommodations are provided in a timely manner. 

2. **Religious observances.** Accommodations for absences due to religious observance should be noted. 
   [http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S1.5.htm](http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S1.5.htm)

3. **Students called to active military duty.** Accommodations for absences due to call-up of reserves to active military duty should be noted. 
   [http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S40.htm](http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S40.htm)

4. **Incompletes.** A notation of "incomplete" may be given in lieu of a final grade to a student who has carried a subject successfully until the end of a semester but who, because of illness or other unusual and substantiated cause beyond the student's control, has been unable to take or complete the final examination or to complete some limited amount of term work. 

5. **Discriminatory conduct (such as sexual harassment).** Discriminatory conduct will not be tolerated by the University. It poisons the work and learning environment of the University and threatens the careers, educational experience, and well-being of students, faculty, and staff. 
   [http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S47.pdf](http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S47.pdf)

6. **Academic misconduct.** Cheating on exams or plagiarism are violations of the academic honor code and carry severe sanctions, including failing a course or even suspension or dismissal from the University. 
   [http://www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm](http://www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm)

7. **Complaint procedures.** Students may direct complaints to the head of the academic unit or department in which the complaint occurs. If the complaint allegedly violates a specific university policy, it may be directed to the head of the department or academic unit in which the complaint occurred or to the appropriate university office responsible for enforcing the policy. 
   [http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S49.7.htm](http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S49.7.htm)

8. **Grade appeal procedures.** A student may appeal a grade on the grounds that it is based on a capricious or arbitrary decision of the course instructor. Such an appeal shall follow the established procedures adopted by the department, college, or school in which the course resides or in the case of graduate students, the Graduate School. These procedures are available in writing from the respective department chairperson or the Academic Dean of the College/School. 
   [http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S28.htm](http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S28.htm)

9. **Final Exam.** The final exam requirement, the final exam date requirement, etc.
http://www.uwm.edu/Dept/SecU/acad%2Badmin_policies/S22.htm
10. Grading. Grading will follow University policy.
https://www4.uwm.edu/current_students/records_grades/grades.cfm#system

Other Class Policies
1. There is no extra credit available for this course.
2. Attendance is expected and mandatory. Arrival on time is required.
   There is no make-up for field trips or laboratory. Missed notes must be gathered from your study group. Field work requires your flexibility in scheduling.
3) Excused absences must come from a medical doctor or university official stating the times and dates to be excused.
4) Return all equipment and materials to their proper location and clean your space of debris and refuse.
5) Please discuss any special circumstances with your instructor.