

ENSC 410 Biodiversity Survey and Monitoring Class Syllabus
CRN:24474/24447

Fall Semester: One whole week (5 full days) prior to fall semester termed “Pre-semester Week 1”.
3 hours per week for first seven weeks of semester (see below for details).

Location: The week-long intensive class section (8 am to ~ 5pm) will start each day in Leon Johnson Hall 339 and then travel to a field location.

Semester classes will be at 11:00-11:50 Monday and Friday in Reid 124,
and in Reid 302 on Wednesdays for first 6 weeks.

Instructors & Teaching Assistants:

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Office hours: Monday and Wednesday 12-1 pm. You can also make an appointment to meet with any of us in person or virtually.

Course description in catalogue: Biodiversity survey and monitoring designs, sampling methods, and data evaluation techniques are introduced. Emphasis is on plants but other taxa are addressed for agricultural, rehabilitation and wildland systems. One week of fieldwork required prior to semester; course completion mid-October. First week co-convened with ENSC 510.

More detailed description: Both careers and graduate studies in land resources and conservation management require knowledge of how to design, execute, and analyze data concerning biodiversity at multiple scales in time and space. This course will provide students with the theoretical and practical skills associated with surveying and monitoring designs, sampling methods and data analysis techniques to answer questions about biodiversity. We will concentrate on applying and evaluating these methods using plants but will also gain field experience with other taxa. Application of the biodiversity designs and methods will be to three main system types: agriculture, rehabilitation/restoration, and wildland.

Course objectives:

- Understand a variety of methods and techniques to measure and sample for biodiversity.
- Develop hands-on knowledge of various biodiversity sampling methods and response metrics used on plants and insects.
- Gain knowledge of sampling design, data collection methods, and basic data analysis.

- Understand how to apply methodologies to different field situations depending on goals of management or research.
- Develop biodiversity research project (R designated course for undergraduates).

This course is a Research and Creative Experience (R) core class.

As such it addresses two of MSU's core requirements: MSU graduates are effective 1) communicators, and 2) thinkers and problem solvers.

- 1) This course will hone your written, spoken, and visual communication skills, to allow you to build relationships and foster understanding with other scientists and land managers. The course will give you experience in openly and constructively giving and receiving feedback, and using that feedback to revise and improve your own written and oral communication. By conducting your own research you will improve your data analysis and interpretation skills, and through reading and evaluating the scientific literature you will be able to evaluate the quality of different information sources and use that to empower and challenge your own and each other's thinking.
- 2) This course improves your critical thinking and problem-solving capacity through gathering relevant evidence from the scientific literature. As part of your research project you will improve your ability to ask concise relevant questions, collect and analyze the data - while understanding the assumptions and limitations of your approach, in order to draw appropriate conclusions.

Course schedule: During the first week topic areas will be introduced using an interactive lecture format and readings. Hands-on aspects of these topics will be applied under field conditions. In order for this class structure to be possible, students will be required to take a one-week intensive class section (40 hrs) prior to the start of the fall semester. **To prepare for this week - students are required to complete readings (~10-20 hrs). There are quizzes pertaining to these readings and associated lectures daily during the first week.** The aim of the pre-field class readings and associated quizzes is to ensure ample background knowledge is acquired to gain maximum benefit from the intensive class section. Dr. Rew will be available for consultation before classes start if you have questions. The fifth and possibly sixth day (Monday and Tuesday, depending on the project and number of people sampling) of the one-week intensive will be spent collecting data for research projects. IF, you need to collect any additional data *this must be completed within the first 8 days of semester.*

During semester the remaining class time (~18 hours) will be used to teach in more depth about biodiversity, report writing, and data analysis techniques using data collected during the field portion of the course. Students will develop research project associated with questions of particular interest. This doesn't sound much but it is intense – we are fitting a full 15 week course into 8 weeks.

The expectations of 400-level students will be to develop a biodiversity research project as small groups (2-4 people). This includes collecting field data together, doing the analysis, and writing the introduction & methods together, working on the analysis together but writing the results and discussion individually. You will get feedback on the group work from your colleagues, TA and Dr. Rew. The final project report will be submitted individually and must address feedback and include an individual results and discussion. This research project, combined with field experiences, will fulfill the R component of undergraduate requirements.

Prerequisites: NRSM 240 OR BIOE 370, BIOB 318 or STAT 216. Preferred GPHY 284 and BIOO 230

Textbooks: There are no required texts but the following book is highly recommended. "Biological Diversity: frontiers in measurement and assessment" Edited by Anne E. Magurran and Brian J. McGill, Oxford Press. Additional literature is posted on the class website.

Expectations: It is expected that you:

- will wear a mask in the vehicles and in proximities of less than 6' if not vaccinated
- will perform the required reading **prior to attending the pre-semester intensive class section and normal semester classes. Participation in class discussion is expected.**
- **attend the entire intensive section** which will generally be from 8 am – 5pm though earlier starts and later finish times are possible, as is staying away from Bozeman for 1 or more nights (not this year). The intensive section will take place the week directly before the start of semester (Tuesday-Friday and following Monday-Tuesday this year). **As part of each day will be spent outdoors you are expected to have appropriate attire and sufficient sustenance for the duration.**
- spend one-two days of the intensive week (following Monday-Tuesday) collecting research project data, however, you are expected to complete any further necessary data collection in your own time within the first 8 days of semester. If you already have data from your research project you can use that but need to check with Dr. Rew first.
- **do not skip any of the first intensive week of class – each 8 hour day is essentially worth 2-2.5 weeks of a semester.**
- attend class for the first 7 weeks of semester, during which you will continue development of your research project and will cover new subject material through reading, discussion and writing assignments (more detail below). The final project due date is approximately 8 weeks into the fall semester.
- under all situations, will participate by asking questions and providing constructive commentary. Collecting, entering and analyzing data is also a requirement.
- are willing and capable of using various computer software packages such as word, and excel, and preferably have an understanding of R.
- will not use mobile phones and other portable electronic devices for personnel topics during class.
- *not plagiarize.* Plagiarism includes direct copies from websites as well as books and journals. If a student is caught plagiarizing it can lead to expulsion from the class and sometimes college.
- will have internet access and use email to communicate with the instructors and TA and that you check the course web site for updates on readings and assignments.
- will contact Dr. Rew or TAs, as appropriate, if you are ill or have an emergency that will impact your capacity to attend and participate in class.

Grading: Your grade in the course will be based on your performance in quizzes (~25-30%), data analysis homework assignments (~25-30%), class and field participation (~5-10%), and biodiversity project (~35-40%). (As you can see the exact percentages may vary). *Turning in assignments late is not acceptable, if less than 24 hours late you will get 10% deduction if more you get 0, this class is too compressed to have late assignments.*

Grades are calculated as follows:

A >94	B+ 87-89.9	C+ 77-79.9	D+ 67-69.9	F <60
A- 90-93.9	B 84-86.9	C 74-76.9	D 64-66.9	
	B- 80-83.9	C- 70-73.9	D- 60-63.9	

Academic Integrity

“Montana State University believes that academic honesty and integrity are fundamental to the scholastic mission of higher education and have established standards to sustain them. Students who violate these standards will be subject to academic and/or disciplinary sanctions.” According to MSU policy, “The integrity of the academic process requires that credit be given where credit is due. Accordingly, it is academic misconduct to

present the ideas or works of another as one's own work, or to permit another to present one's work without customary and proper acknowledgment of authorship. Students may collaborate with other students only as expressly permitted by the instructor. Students are responsible for the honest completion and representation of their work, the appropriate citation of sources and the respect and recognition of others' academic endeavors." (Policy 340.00) Other Conduct Guidelines and Grievance Procedures for Students for 2004-2005 are available on the Web: at http://www2.montana.edu/policy/student_conduct/. Students in this course are encouraged to discuss assignments and share ideas, but each must hand in his or her own original work to receive credit. Students must work independently and without aids on quizzes. **Cheating or plagiarism will result in course failure.**

Students with Disabilities

If you have a documented disability for which you are or may be requesting accommodation, you are encouraged to contact your professor and Disabled Student Services as soon as possible. Their office is located in the Strand Union Building Room 155, phone 406-994-2824.

Inclusivity Statement:

I support an inclusive learning environment where diversity and individual differences are understood, respected, appreciated, and recognized as a source of strength. MSU expects that students, faculty, administrators and staff at MSU will respect differences and demonstrate diligence in understanding how other peoples' perspectives, behaviors, and worldviews may be different from their own.