



SYLLABUS

ENR

5350.01

Taxonomy and
Behavior of
Aquatic
Invertebrates
Spring 2024

COURSE OVERVIEW

This course investigates the taxonomy and behavior of freshwater aquatic invertebrates. to freshwater systems and its abiotic and biotic components. During the semester we will look at general morphology, taxonomy, phylogeny, ecology, behavior, adaptations, and diversity of freshwater aquatic invertebrates. Students will demonstrate lab and field techniques during the semester to collect invertebrate data for biomonitoring and curate their own collections.

Contact Information

Instructor: Zachary Steffensmeier
Email: Steffensmeier.7@osu.edu
Office Hours: By appointment
Phone #: 614-517-4568

Lecture Location: 102 Kottman Hall
Lecture Time: Monday 1:50-2:45 PM

Lab Location: Olentangy River Wetland Research Park (ORWRP)
Lab Time: Tuesday 11:30AM-2:30 PM



Grade Breakdown:

- 2 exams total (each 20% of final grade; 40% total)
 - Exams are based on lectures, assigned journal readings, and lab sessions. Exams consist of short answers, multiple choice, and laboratory specimen identification. Unless otherwise arranged, exams must be completed during class time.
- Lab Quizzes and Lab Participation (15% of final grade)
 - Quizzes will be given at the beginning of most laboratories. The student will be responsible for reading the modules in advance and being up to date with any other material provided. The format and value of each quiz may change accordingly. The laboratory's dynamic is based on the active performance of field techniques. Therefore, your regular attendance and participation are crucial to the lab grade.
- Collection Catalog and Field Notebook (30%)
- Project and presentation (15% of final grade)
 - The instructor reserves the right to define the format of this project and undertakes to announce every detail in advance.

Grading scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-
67–69.9: D+
60–66.9: D
Below 60: E

****LECTURE AND LAB COURSE SCHEDULE (SUBJECT TO CHANGE)**

Lecture and Lab Schedule

Week	Date	Topic	Assignment/Quiz
1	8-Jan	Introduction to Aquatic Insects of North America	
	9-Jan	No Lab	
2	15-Jan	No Class - MLK Day	
	16-Jan	Safety and General Morphology Lab	



3	22-Jan	Sampling Aquatic Insects	
	23-Jan	Ephemeroptera Lab	Quiz 1
4	29-Jan	Aquatic Insect Respiration	
	30-Jan	Odonata Lab	Quiz 2
5	5-Feb	Life History, Habitat, Secondary Production, and Behavioral Adaptations	
	6-Feb	Plecoptera Lab	Quiz 3
6	12-Feb	Ecology and Distribution	
	13-Feb	Hemiptera Lab	Quiz 4
7	19-Feb	Bioassessments	
	20-Feb	Sampling Techniques	Quiz 5
8	26-Feb	Phylogeny and Adaptations	Exam #1
	27-Feb	Megaloptera, Trichoptera	
9	4-Mar	Aquatic Food Webs	
	5-Mar	Mussel Collections	Quiz 6: Museum of Biological Diversity
10	11-Mar	Spring Break	
	12-Mar	Spring Break	
11	18-Mar	Anthropogenic Effects on Aquatic Invertebrates	
	19-Mar	Field Trip to Highbanks Metro Park	No Quiz
12	25-Mar	Aquatic Hymenoptera, Diptera, and Tipuloidea	
	26-Mar	Collecting Trip TBD	No Quiz
13	1-Apr	Sponges, Flatworms, Hairworms, Snails	
	2-Apr	Collecting Trip TBD	No Quiz
14	8-Apr	Mites, Spriders, Fairy Shrimp, Copepods, Crayfish	
	9-Apr	Collecting Trip: Olentangy River	No Quiz
15	15-Apr	Future of Aquatic Inverts	
	16-Apr	Project Presentations	Project Presentations or Journal Articles Due
16	22-Apr	Curate Collections	Exam #2
	26-Apr	Collections turned in	Collections Due



Quizzes

There will be a pre-laboratory quiz each week covering Order, Family, Genus and Common name as well as key characters. These will be short (around 5 questions) lab practicals and be in person at the start of lab. If you do not show up or are late to lab, you may not take the quiz. I will drop your lowest quiz grade, only if you complete all the quizzes during the semester (i.e. If you are absent from a lab, you cannot drop that quiz grade of 0%).

Poster Presentations

Students will work in groups of 2 people to analyze and present data collected by the individuals or groups. Projects must be bioassessment focused using aquatic invertebrates but can also be diverse and applied to other streams, watersheds, or areas. Rubric will be uploaded to Carmen. I will work with each group to come up with a project by March 1.

Textbook and Materials

- Thorp, J.W and D.C. Rogers. 2011. Field Guide to Freshwater Invertebrates of North America. Academic Press, 304 pp. ISBN: 978-0-12-381426-5. Available online through OSU library. Referred to as “Field Guide”
- Thorp, J.H. and Covich, A.P. eds., 2009. Ecology and classification of North American freshwater invertebrates. Academic press. ISBN: 978-0-08-088981-8. Available online through OSU library. Referred to as “T&C”
- Bouchard, R.W., Jr. 2004. Guide to aquatic macroinvertebrates of the Upper Midwest. Ferrington, L.C., Jr. and M.L. Karius, Eds. Water Resources Center, University of Minnesota, St. Paul, MN, 208 pp. Available online: use QR code or <https://dep.wv.gov/WWE/getinvolved/sos/Pages/UMW.aspx>
Referred to as “Midwest”, QR code is link to webpage
<https://dep.wv.gov/WWE/getinvolved/sos/Pages/UMW.aspx>

Required materials • Rite in the Rain All-Weather notebook. Various sizes acceptable, suggested 4 5/8” x 7”. Any type of paper gridding accepted. Other similar, water-resistant notebooks accepted.

Optional:

Merritt, R. W., K. W. Cummins, and M. B. Berg (eds). 2008. An Introduction to the Aquatic Insects of North America (4th ed). Kendall/Hunt Publ. Co., Dubuque, IA 1158 pp. ISBN: 978-0757563218
(Note, we have copies to borrow during lab at the Wetlands)

Appstore: PocketMacros; Great app for learning while in the field!



Late Work Policy

The penalty for late assignments is 20% of the assignment total per day. There should be extenuating circumstances for missing a scheduled activity, quiz or exam. In these cases, early arrangements will need to be coordinated.

****IMPORTANT:** You must contact the instructors PRIOR TO a planned conflict to make arrangements for modified deadlines. Otherwise, no arrangements will be made. If you are ill the day of an assignment/exam, you must reach out to the instructors with verification of your absence on the day of the missed deadline, otherwise no accommodations will be made. If you would like any clarification on this, don't hesitate to reach out.

Attendance Policy

Credit hours and work expectations: This is a 3-credit-hour course. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Note: Lecture and lab attendance will be included in your final grade.

Academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report my suspicions to the Committee on Academic



Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact us.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,



3. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen site for this course; and can also be found at <https://go.osu.edu/principlesofcommunity>. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu/>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://studentlife.osu.edu/bias/report-a-bias-incident.aspx>.

Counseling & Consultation Services/Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24-hour emergency help is also available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org.



David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Go to <http://ods.osu.edu> for more information.