

FAS 4932 Biology of Aquatic Invertebrates

1. Course Overview

Spring 2025, 4 credit hours

Format: In-person

Instructor: Dr. Lindsey Reisinger

lreisinger1@ufl.edu, (352) 294-1355, Dequine Building 113

Office hours via Zoom Monday 12:00 - 2:00 pm (<https://ufl.zoom.us/j/98700865323>)

Teaching assistant: Coleson Wrege

wregec@ufl.edu

Recommended Text: Biology of the Invertebrates, Seventh edition, by Jan Pechenik. McGraw-Hill Education. 2015.

Scientific papers will be assigned each week and available through the Canvas site.

Course Description

Examination of the form, function, diversity, and ecology of invertebrates that live in aquatic environments. The invertebrates include the vast majority of animals on the planet and many of the major invertebrate groups are only found in aquatic ecosystems. Lectures will focus on the characteristics of each of the major aquatic invertebrate phyla. In the laboratory, students will collect, identify, and examine aquatic invertebrates from freshwater and coastal ecosystems.

2. Learning Outcomes

Lecture

- Identify the evolutionary relationships among the major aquatic invertebrate phyla
- Identify and describe the key features of the major aquatic invertebrate phyla including their form, function, habitats, and life history characteristics
- Explain the features and adaptations of aquatic invertebrates that allow them to live in aquatic environments
- Explain ecological role of each major aquatic invertebrate group in freshwater or marine ecosystems
- Identify and describe the major threats to aquatic invertebrate abundance and diversity
- Evaluate and critique research focused on aquatic invertebrate ecology
- Formulate informed hypotheses about how changes in the distribution or abundance of invertebrate taxa would impact aquatic ecosystems

Laboratory

- Investigate invertebrate form, function, and behavior by observing specimens or live animals
- Identify and describe common methods for sampling aquatic invertebrates
- Identify aquatic invertebrates based on key features of the group
- Collect and interpret scientific data focused on aquatic invertebrate ecology

3. Course Logistics

This course will be made up of in-person lectures that will focus on the characteristics, evolutionary relationships, and ecological roles of organisms in each of the major aquatic invertebrate phyla. Students will be able to access reading assignments through the course Canvas site as they become available.

This course will also include a lab where students will examine the anatomy and behavior of aquatic invertebrates, collect and identify aquatic invertebrates from fresh water and coastal ecosystems, and design and carry out a scientific study focused on aquatic invertebrate ecology in freshwater ecosystems at the Millhopper campus and Blues Creek Preserve.

Class meeting times:

Lecture: Newins-Ziegler 222, Monday 8:30 – 9:20 am & Wednesday 8:30 – 10:25 am

Lab: Newins-Ziegler 219, Tuesday 3:00 – 6:00 pm or Friday 12:50 – 3:50 pm

Technology Requirements:

- A computer or mobile device with high-speed internet connection.
- A webcam, headset and/or microphone, and speakers.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser.
- Installation of proctoring software may be required and will be provided if so.

3.1 Description of Assessments and Activities

List of Graded Work:

The lecture portion of the class makes up 70% of the grade (quizzes, exams, reading engagement, class participation). The laboratory portion of the class makes up 30% of the grade (project and notebook).

Assignment	Description	Points
Quizzes (11)	Quizzes will emphasize the key features of each phylum (emphasis on form, function, and life cycle)	20* (2 per quiz)
Midterm Exam	Exam focused on the lecture material covered in weeks 1 – 7	15
Final Exam	Cumulative exam focused on the material covered throughout the course in the lecture section	20
Reading Engagement	This course will use Perusall to allow students to interact with one another while reading scientific papers and assess student engagement with the readings	10
Class Participation	Participate by attending and engaging during lecture periods and discussions focused on scientific papers	5
Lab Project	Students will design and carry out a research project focused on aquatic invertebrate ecology (in groups of 2 - 3), using the freshwater ecosystems (wetlands, ponds, streams) at the Millhopper campus and Blues Creek Preserve. The project grade will be based on a research proposal (3 pts), final presentation (6 pts), and scientific report (9 points).	18
Lab Notebook	A notebook with detailed notes on observations during lab and a record of data/results/answers from activities for each lab period. This will also be a log of field trips and data collected for the lab project.	12
		TOTAL = 100

* the lowest quiz grade will be dropped

3.2 Grades and Grading Scale

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

A	94 – 100% of possible points		C	74 – 76.99%
A-	90 – 93.99%		C-	70 – 73.99%
B+	87 – 89.99%		D+	67 – 69.99%
B	84 – 86.99%		D	64 – 66.99%
B-	80 – 83.99%		D-	60 – 63.99%
C+	77 – 79.99%		E	<59.99

Final grades will not be bumped up or down to any extent to result in a different letter grade. Your grade will be based on the score you earn on each of the assignments in the list of graded work (nothing more and nothing less). There is one (optional) extra credit activity which is the coastal field trip (worth 4 points).

4. Learning Content

Week 1: January 13 - 17

Course introduction, overview of the invertebrates

Life in aquatic environments

Lab 1 – Benthic invertebrate sampling wetlands

Week 2: January 20 - 24

No class Monday (Martin Luther King Day)

Invertebrate body plans and anatomy

Lab 2 – Zooplankton sampling ponds

Week 3: January 27 - 31

Invertebrate classification and relationships

Invertebrate life cycles

Lab 3 - Benthic invertebrate sampling streams

Week 4: February 3 - 7

Protists

Porifera

Lab 4 – Project proposals due, students will peer review proposals during lab period & hydra activity

Week 5: February 10 -14

Cnidaria

Lab 5 - Students collect data for project

Week 6: February 17 - 21

Ctenophora

Gnathifera (Rotifers, Acanthocephalans)

Lab 6 - Students collect data for project

Week 7: February 24 - 28

Platyhelminthes

Nemertea

Lab 7 - Students collect/analyze data for project

Week 8: March 3 - 7

Mid Term Exam

Mollusca

Lab 8 - Freshwater mussel activity

Week 9: March 10 - 14

Mollusca continued

Lab 9 - Freshwater gastropod activity & last day to collect/analyze data for project

Spring Break

Week 10: March 24 - 28

Annelida

Lab 10 – No lab during regular lab period

Field trip to sample coastal aquatic invertebrates (Sunday, March 30th)*

Week 11: March 31 – April 4

Arthropoda – General features and crustaceans

Lab 11 - Crayfish behavior activity

Week 12: April 7 - 11

Arthropoda – Insects and other groups

Lab 12 - Student presentations (day 1)

Lab notebooks due in class on Monday

Week 13: April 14 - 17

Nematoda & relatives

Bryozoa

Lab 13 - Student presentations (day 2)

Week 14: April 21 - 23

Echinodermata

Hemichordates and Chordates

No lab

Final exam: Thursday May 1st from 3:00 – 5:00 pm

* Sunday field trip to sample coastal aquatic invertebrates at Whitley Lab/Marineland or Cedar Key (not required but strongly encouraged – 4 points extra credit)

5. Policies and Requirements

5.1 Attendance, Late Submissions & Make-up Requests

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Class participation is an essential part of the class and is 5% of the grade. Students can participate by attending class sessions and actively contributing to the discussion in a respectful way.

- Reading discussions are required because the discussion is an essential part of understanding and evaluating the scientific paper. Students are allowed to miss up to two discussion sessions during the semester. After that, each absence from a reading discussion that does not meet university criteria for “excused” will result in a 2-point deduction from your participation grade.
- NOTE: If you have personal issues that prohibit you from joining freely in class discussion, e.g., shyness, language barriers, etc., see the instructor as soon as possible to discuss alternative modes of participation.
- Assignments are expected to be turned in on time, and the due dates are designed to prevent a substantial amount of work from piling up. I will accept late assignments up until the date of the next exam or before of the last day of class, whichever comes first. For example, if an assignment was due the first week of class, it would not be accepted after the date of the midterm exam. Likewise, if an assignment was due in week 10, it would not be accepted after the last day of class.
- Students are expected to take exams and quizzes on the assigned date including the final exam. If you must miss an exam or quiz on the date it is assigned due to an absence that meets the University criteria for “excused,” please email the instructor as soon as possible to reschedule.

5.2 Communication Courtesy and Professionalism

Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. **Respect for individual differences and alternative viewpoints will be maintained in this class at all times.** All members of the class are expected to follow rules of common courtesy, decency, and civility in all interactions. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students’ Office.

5.3 Semester Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.ua.ufl.edu/students/>.

Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.ua.ufl.edu/public-results/>.

5.4 Academic Honesty Policy

UF students are bound by The Honor Pledge which states “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the UF Conduct Code website for more information. If you have any questions or concerns, please consult with the instructor or TAs in this class.

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see:

<https://policy.ufl.edu/regulation/4-040/>

5.5 Inclusive Learning Environment

This course embraces the University of Florida’s Non-Discrimination Policy, which reads, *The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans’ Readjustment Assistance Act.*

5.6 Privacy Statement

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

5.7 In-class recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal education use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and deliver by an instructor hired or appointed by the University, or by a guest instructor, as part of a University of

Florida course. A class lecture does not include lab sessions, student presentations, clinical presentation such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

5.8 Services for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See the "Get Started With the DRC" webpage on the Disability Resource Center site <https://disability.ufl.edu/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

5.9 Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

6. Campus Helping Resources

6.1 Whole Gator App

The Whole Gator and website and app connects UF students with resources dedicated to supporting overall health and well-being. In addition to many of the resources below it also has strategies to practice self-care. <https://one.ufl.edu/whole-gator/topics>

6.2 Health and Wellness

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non- crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
- University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.
- Student Success Initiative, <http://studentsuccess.ufl.edu>

6.3 Academic Resources

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

- Career Connections Center: Reitz Union Suite 1300, 352-392- 1601. Career assistance and counseling services.
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources. Call 866-281-6309 or email ask@ufl.libanswers.com for more information.
- Teaching Center: 1317 Turlington Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- Writing Studio: Daytime (9:30am-3:30pm): 2215 Turlington Hall, 352-846-1138 | Evening (5:00pm-7:00pm): 1545 W University Avenue (Library West, Rm. 339). Help brainstorming, formatting, and writing papers.

6.4 Student Complaints

- Academic Complaints: Office of the Ombuds; Visit the Complaint Portal webpage for more information.
- Enrollment Management Complaints (Registrar, Financial Aid, Admissions): View the Student Complaint Procedure webpage for more information.
- Residential Course: <https://www.ombuds.ufl.edu/complaint-portal/>
- Online Course: <https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint>