

Invertebrate Zoology (BSC 376) – Spring 2019

Lecture: MWF 10:00 to 10:50 am, 205 Biology Building
Laboratory: Section 02: R 1:00 to 2:50 pm, 2432 SEC
Section 03: R 11:00 am to 12:50 pm, 2432 SEC
Instructor: Dr. Kevin Kocot
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Course web page: <http://ualearn.blackboard.com>

Required text: *Invertebrates* (Third Edition) by Richard C. Brusca, Wendy Moore, and Stephen M. Shuster. Some additional readings from the primary literature and weekly laboratory handouts will be provided by the instructor and teaching assistants. A dissecting kit (with fine-point scissors, forceps, a scalpel, extra scalpel blades, probes, and dissecting pins) is also required for lab.

Prerequisites: BSC 114/115 and BSC 116/117 or BSC 118 and BSC 120.

Course description: This course is designed to provide students with comprehensive exposure to the subject of invertebrate zoology. Students will learn about the diversity, taxonomy, systematics, ecology, evolution, structure, and function of invertebrates. We will cover all animal phyla from Annelida to Xenacoelomorpha and explore diversity within phyla based on available exemplars. Students will learn about the field of invertebrate zoology in light of information gained through the use of traditional tools like electron microscopy and histology as well as new tools like genomics and evolutionary developmental biology (“evo-devo”). If you like going to zoos and aquariums, you should like this course. The specific topics to be covered are listed in the tentative schedule at the end of this syllabus. Registration is required for both lecture and laboratory. Writing proficiency within this discipline is required for a passing grade in this course.

Student learning outcomes: Invertebrate zoology seeks to understand the diversity, disparity and evolutionary history of animals without backbones. Students in this course are expected to:

1. Use taxonomic names and zoological terminology correctly.
2. Identify and classify invertebrates based on morphological, developmental, molecular, and other characters.
3. Determine invertebrate adaptations to their environment and how these adaptations evolved as a result of both where and how an animal lives and their evolutionary circumstances.
4. Identify the events and processes that explain animal diversity.
5. Summarize and criticize primary literature in the field of invertebrate zoology in writing.

Performance criteria and grading: Students in Invertebrate Zoology can expect the following criteria to be used in evaluating their performance (total of 850 points):

300 points	Three lecture exams (100 points each)
150 points	Final exam (roughly 75 points covering new material and 75 points comprehensive)
150 points	Two writing assignments (50 and 100 points, respectively)
150 points	Two lab practical exams (75 points each)
100 points	Quizzes (10 points each; only best 10 of 12+ will be graded)

Lecture exams: There will be three regular lecture exams and one final. The final exam will cover material after exam 3 but it will also be partially comprehensive (roughly 75/150 points). Lecture exams and the final will generally be a combination of multiple choice, true/false, matching, fill in the blank, short answer, and/or essay questions. Exams will test your understanding of the course material and your ability to apply and communicate your knowledge scientifically and synthetically. The tentative date for each lecture exam is given in the class schedule below. The final exam will be given at the time prescribed by the university, which is given in the class schedule below.

Writing assignments: BSC 376 is a writing (W) course. As such, writing proficiency is required for a passing grade in the course. This means that if you do not score at least 60% of the points from the writing assignments, you will not pass the course regardless of your performance otherwise. These assignments will require coherent, logical, and carefully edited prose and require students to demonstrate higher-level critical thinking skills. All writing assignments must conform to the formatting guidelines provided by your instructor (more details will be provided in class). Writing assignments are submitted online through TurnItIn in Blackboard and will be electronically screened for plagiarism. In addition to your

instructor's office hours, the UA Writing Center (<http://writingcenter.ua.edu/>) is available to help you improve your writing. There will be two writing assignments (more details on these assignments will be provided in class).

Laboratory midterm and final exams: Lab exams are practical exams that consist of stations with specimens or photos of specimens. Students will be required to identify organisms, structures, etc. by name and answer questions about them based on material covered in lab. Taxonomic names and terms that may be covered in lab exams will be listed in the weekly lab handout.

Quizzes: There will be a minimum of twelve quizzes worth ten points each offered over the course of the semester. Each student's best ten quiz scores are counted (i.e., the lowest scores are dropped). Quizzes may or may not be announced in advance. Please review your notes after class in preparation for a possible quiz. Multiple choice and true/false questions will be worth one point each. The point value of short answer and other types of questions will be indicated. The instructor reserves the right to be creative with the definition of "quiz" and will try to keep things fun. Quizzes will cover previous lectures and reading.

Laboratory:

Materials to bring to each lab session:

- *Invertebrates* textbook
- Lab notebook (separate notebook from your lecture notes)
- Dissecting kit
- Pencils and eraser for drawings (you may want to use colored pencils)

General lab policies and procedures:

1. Be on time: Your TA will begin lab promptly and two hours is barely enough time to get through all the material.
2. Be safe: Wear closed-toes shoes, tie back long hair, and don't eat or drink in the lab. We will use sharp tools, open flames, and dangerous chemicals such as nitric acid and formaldehyde. Follow all signs and instructions and use common sense to avoid injury and/or damage to your clothing.
3. Be careful: Hold microscopes with both hands when you pick one up. Clean the lenses only with lens paper. Learn to adjust the microscopes properly. If you don't know how to use a microscope correctly, please ask. It will make your life easier and prevent damage. Please don't leave slides in the microscope!
4. Be economical: Re-use slides and coverslips. Wash slides with water and dry them with a paper towel. Broken microscope slides and used coverslips should be disposed of in the box marked "Broken Glass."
5. Be considerate: Please clean your work area after lab. Clean and return all materials (specimens, prepared slides, dissecting tools, etc) to where they belong after you finish your work.

Grading policy: Grades are based on a percentage derived from total points accumulated during the semester:

A+ = 97-100	B+ = 87-89.9	C+ = 77-79.9	D+ = 67-69.9	F < 60
A = 94-96.9	B = 84-86.9	C = 74-76.9	D = 64-66.9	
A- = 90-93.9	B- = 80-83.9	C- = 70-73.9	D- = 60-63.9	

In order to ensure a fair and accurate representation of the performance of all the students in the class, the instructor reserves the right to modify the above point distribution in the student's favor for all students in the course in the event of unusual circumstances that prevents a large proportion of the class from completing class requirements in the normal fashion. Additionally, 'bonus' questions may be added to lecture or lab exams. Otherwise, please do not ask for extra credit or extra work to improve your grade.

Class attendance and participation policy: Attendance to lecture and lab are mandatory (but should be fun!). Class attendance will not be taken but quizzes covering previous lecture material, which may or may not be announced in advance, will be given in lecture. The instructor will attempt to record all lectures using Tegrity and will make these recordings available via Blackboard.

Policy on missed lecture examinations and coursework: Students will be permitted to make up missed coursework only with a significant, documented excuse (generally health related) that should be submitted as soon as possible. Requests for makeup exams made after the exam will only be granted for emergencies. Make-up exams may be different from regular exams and generally consist predominantly of essay and fill-in-the-blank questions. Missed quizzes cannot be made up. Excused absences must be verifiable and written by an authorized individual (e.g., physician, dentist, minister, judge, etc), and must clearly indicate that the student was unable to attend the laboratory session in question. Please notify the instructor you will be absent from lab ahead of time if you can. The student is responsible for contacting the instructor to arrange a make-up of work missed due to an excused absence. Excused absences include:

1. Illness of self or a dependent provided the instructor is given a valid physician's note.
2. Official participation in UA-sponsored activities (including student athletes).

3. Absences of students registered with the Office of Disabilities Services for disabilities eligible for "a reasonable number of disability-related absences" provided such students give the instructor notice of a disability-related absence.
4. Severe weather emergencies that prohibit a student from attending a scheduled laboratory session.
5. Death of a family member (to include children, parents, siblings, grandparents, parents-in-law and other first-degree relatives).
6. Jury or military duty, provided that official documentation is given to the instructor.

Students with disabilities: If you are registered with the Office of Disability Services, please make an appointment with me as soon as possible to discuss any course accommodations that may be necessary. If you have a disability but have not contacted the Office of Disability Services, please call 348-4285 to register for services. Students should set up all exams (including the final) at ODS during the first two weeks of the semester to ensure that they have a spot for testing.

Academic misconduct: All acts of dishonesty in any work constitute academic misconduct. This includes but is not limited to cheating, plagiarism, and fabrication of information, misrepresentations and abetting of any of the above. The Academic Misconduct Policy will be followed in the event that academic misconduct occurs. Students should refer to the Student Affairs Handbook, which can be obtained in the Office of Student Life and Services in the Ferguson Center. The University of Alabama expects all students to conduct their studies in an honorable manner. Any form of academic misconduct will result in appropriate penalties, which may include dismissal from the university.

As an academic community, our educational mission is enhanced by the robust exchange of ideas that occurs between a diverse student body, faculty, and staff within a respectful and inclusive learning environment. All members of the UA community are expected to contribute positively to the environment and to refrain from behaviors that threaten the freedom or respect that every member of our community deserves. UA is committed to providing an inclusive environment that is free from harassment or discrimination based on race, genetic information, color, religion, ethnicity, national origin, socioeconomic status, political beliefs, sex, sexual orientation, gender expression, gender identity, age, ability, size, or veteran status. UA prohibits any verbal or physical conduct that threatens or endangers the health or safety of any individual or group, including physical abuse, verbal abuse, threats, stalking, intimidation, harassment, sexual misconduct, coercion, and/or other communication or conduct that creates a hostile living or learning environment. Harassment or other illegal discrimination against individuals or groups not only is a violation of University Policy and subject to disciplinary action, but also is inconsistent with the values and ideals of the University.

UAct: The University of Alabama is committed to an ethical, inclusive community defined by respect and civility. The UACT website (www.ua.edu/uact) provides extensive information on how to report or obtain assistance with a variety of issues, including issues related to dating violence, domestic violence, stalking, sexual assault, sexual violence or other Title IX violations, illegal discrimination, harassment, child abuse or neglect, hazing, threat assessment, retaliation, and ethical violations or fraud.

UA Severe Weather Policy: In the event of severe weather, all classes will meet as planned unless the University of Alabama in conjunction with the National Weather Service recommends alternative safety precautions (e.g., temporary suspension of classes, closing the university). Please note that for this class, we will follow the weather advisory posted on the University of Alabama's homepage (<http://ua.edu/>) for information on any class cancellations or changes.

TENTATIVE LECTURE AND LABORATORY SCHEDULE – SPRING 2019

<u>Date</u>	<u>Lecture Topic</u>	<u>Reading(s)</u>	<u>Laboratory Topic</u>
Wednesday, January 09	Lecture 1: Introduction	Chapter 1	
Thursday, January 10			
Friday, January 11	Lecture 2: Systematics, phylogeny, and classification	Chapter 2	
Monday, January 14	Lecture 3: Animal body plans	Chapter 4	
Wednesday, January 16	LAST DAY TO DROP WITHOUT A W ; Lecture 4: Animal development, life histories, and origin	Chapter 5	
Thursday, January 17			Laboratory introduction; scientific writing
Friday, January 18	Lecture 5: Porifera and Placozoa	Chapter 6	
Monday, January 21	NO LECTURE (MARTIN LUTHER KING JR. DAY)		
Wednesday, January 23	Lecture 6: Ctenophora	Chapter 8	
Thursday, January 24			Porifera
Friday, January 25	Lecture 7: Cnidaria I	Chapter 7 (part)	
Monday, January 28	Lecture 8: Cnidaria II	Chapter 7 (part)	
Wednesday, January 30	Lecture 9: Acoelomorpha and Xenoturbellida (Xenacoloomorpha)	Chapters 9	
Thursday, January 31			Ctenophora and Cnidaria
Friday, February 01	Lecture 10: Gnathifera (Rotifera, Gnathostomulida, & Micrognathozoa)		
Monday, February 04	EXAM 1 (LECTURES 1-9)	Chapter 16	
Wednesday, February 06	Lecture 11: Platyhelminthes	Chapter 10	
Thursday, February 07			Gnathifera and Platyhelminthes
Friday, February 08	Lecture 12: Dicyemida (=Rhombozoa), Orthonectida, Chaetognatha, and Gastrotricha	Chapter 11	
Monday, February 11	Lecture 13: Nemertea	Chapter 12	
Wednesday, February 13	Lecture 14: Mollusca I	Chapter 13 (part)	
Thursday, February 14			Nemertea, Mollusca (Aculifera)
Friday, February 15	Lecture 15: Mollusca II	Chapter 13 (part)	
Monday, February 18	FIRST WRITING ASSIGNMENT DUE ; Lecture 16: Mollusca III	Chapter 13 (part)	
Wednesday, February 20	Lecture 17: Annelida I	Chapter 14 (part)	
Thursday, February 21			Mollusca (Conchifera)
Friday, February 22	Lecture 18: Annelida II	Chapter 14 (part)	
Monday, February 25	Lecture 19: Lophophorata I	Chapter 17 (part)	
Wednesday, February 27	Lecture 20: Lophophorata II	Chapter 17 (part)	
Thursday, February 28			Annelida and Lophophorata
Friday, March 01	EXAM 2 (LECTURES 10-19)		
Monday, March 04	Lecture 21: Entoprocta and Cyclophora	Chapter 15	
Wednesday, March 06	NO LECTURE (STUDY FOR LAB MIDTERM)		
Thursday, March 07	DEADLINE FOR APPROVAL OF TOPIC FOR SECOND WRITING ASSIGNMENT		LAB MIDTERM
Friday, March 08	NO LECTURE (SPRING BREAK)		
Monday, March 11	NO LECTURE (SPRING BREAK)		
Wednesday, March 13	NO LECTURE (SPRING BREAK)		
Thursday, March 14	NO LECTURE (SPRING BREAK)		NO LAB (SPRING BREAK)
Friday, March 15	NO LECTURE (SPRING BREAK)		
Monday, March 18	Lecture 22: Nematoida (Nematoda and Nematomorpha)	Chapter 18	
Wednesday, March 20	Lecture 23: Scalidophora (Priapulida, Kinorhyncha, and Loricifera)	Chapter 19	
Thursday, March 21			Nematoida and Scalidophora
Friday, March 22	Lecture 24: Tardigrada and Onychophora	Chapter 20 (part)	
Monday, March 25	DRAFT OF SECOND WRITING ASSIGNMENT DUE FOR PEER-REVIEW ; Lecture 25: Introduction to Arthropoda	Chapter 20 (part)	
Wednesday, March 27	Lecture 26: "Crustacea"	Chapter 21	

Thursday, March 28			Tardigrada, Onychophora, and crustaceans
Friday, March 29	Lecture 27: Hexapoda	Chapter 22	
Monday, April 01	PEER REVIEWS OF SECOND WRITING ASSIGNMENT DUE; Lecture 28: Myriapoda	Chapter 23	
Wednesday, April 03	Lecture 29: Chelicerata	Chapter 24	
Thursday, April 04			Hexapoda, Myriapoda, and Chelicerata
Friday, April 05	NO LECTURE (HONORS DAY)		
Monday, April 08	EXAM 3 (LECTURES 20-29)		
Wednesday, April 10	Lecture 30: Echinodermata I	Chapter 25 (part)	
Thursday, April 11			Echinodermata
Friday, April 12	Lecture 31: Echinodermata II	Chapter 25 (part)	
Monday, April 15	Lecture 32: Hemichordata	Chapter 26 (part)	
Wednesday, April 17	Lecture 33: Chordata I	Chapter 27 (part)	
Thursday, April 18			Hemichordata & Chordata
Friday, April 19	SECOND WRITING ASSIGNMENT DUE; Lecture 34: Chordata II	Chapter 27 (part)	
Monday, April 22	Lecture 35: Perspectives on invertebrate phylogeny	Chapter 28	
Wednesday, April 24	Lecture 36: TBD	TBD	
Thursday, April 25			LAB FINAL
Friday, April 26	NO CLASS (STUDY FOR FINAL)		
Tuesday, April 30	FINAL EXAM (11:30 AM to 2:00 PM)		