

BIO 3310 – Invertebrate Zoology Syllabus
Kennesaw State University – Fall 2020

Instructor: Nicholas S. Green, Ph.D.

Contact:

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Course description:

This course is a broad view across all aspects of the biology of invertebrate animals: evolution, ecology, physiology, cell biology, embryology, behavior, and importance to humans. The diversity in form and function of the invertebrates provides interesting and important insights into many areas of biology.

Course prerequisites:

BIO 2107, 2108

Course objectives:

- Distinguish phyla and other taxonomic subdivisions of invertebrates based on unique sets of characteristics possessed by each group.
- Argue phylogenetic relationships among major taxa based on characteristics of organisms surveyed in this course, and understand how such relationships are inferred from evidence.
- Describe the general pattern of phylogenetic relationships (as currently accepted by biologists) among invertebrate taxa and contrast this to previously accepted ideas.
- Generalize patterns and processes of macroevolution and ecology based on the broad survey of biodiversity covered in this course.
- Recognize the ecological, economic, and medical importance of various invertebrate taxa.
- Understand traditional and contemporary scientific methods related to invertebrate biology.
- Relate structures observed in lab to the environment from which organisms were collected by applying evolutionary concepts.

Class meetings:

Meeting type	Location	Day(s)	Time
Lecture	Science Building 212	TR	9:30 am - 10:45 am
Lab	Science Building 245	R	11:00 am - 1:45 pm

Communication:

- The best way to get in touch with me is by KSU e-mail: ngreen62@kennesaw.edu. You should use your KSU e-mail to do so. Do not use a personal, non-KSU account (e.g., Gmail, Yahoo!, etc.).
- We will use **D2L** extensively for content delivery and course-related communication.

Textbooks and other materials:

- One title is **required** for this course: *Biology of the invertebrates* by Jan Pechenik, published by McGraw-Hill. **Any recent edition (5th, 6th, or 7th) is fine.** In the unlikely event of a discrepancy between different editions, the most recent edition (7th) will be considered authoritative.

- Additionally, you will need a blank bound notebook for field and laboratory observations. A “composition” notebook of approximately letter size is ideal and can be found at many retailers for \$3 or less. The style of page (lined, unlined, or gridded) can be whatever you prefer. Spiral-bound or loose-leaf notebooks are not acceptable.
- For lab you will need to wear appropriate lab attire (see “Lab policies”, below)

Testing and grading:

- Your grade in this course is determined by performance on exams, lab assignments, and other assignments. Lecture and lab are not reported separately—both contribute to your final grade (lecture = 55% of available points; lab = 45% of available points).
- Course grades are determined by the number of points that you earn. Neither course grades nor grades on individual assignments will be curved.
- There is no extra credit available in this course.
- The lecture exams and the final exam are cumulative. Lecture exam 2 and the Final Exam will consist of approximately $\frac{2}{3}$ to $\frac{3}{4}$ “new” material (i.e., material encountered in class since the previous lecture exam). Lab practical exam 2 is not cumulative.
- There will be 5 lab assignments that are turned in for credit. Each is worth 12 points, or 3% of the total grade.
- Due dates and times for lab assignments will be communicated when they are assigned.
- Letter grades are assigned according to 10% intervals of the number of points earned (see table on next page).
- Breakdown of grades in the course:

Item	Points	% of total	Date	Day
Mini-exam	20	5%	Sept 3	Thurs
Lecture exam 1	40	10%	Sept 15	Tues
Lecture exam 2	40	10%	Oct 20	Tues
Lecture final exam	60	15%	Dec 10	Thurs
Mini-research paper	60	15%	Dec 10	Thurs
Lab practical exam 1	40	10%	Oct 15	Thurs
Lab practical exam 2	40	10%	Nov 19	Thurs
Lab notebook	40	10%	Dec 10	Thurs
Lab assignments (5)	60	15%	Various	Various
Total:	400	100%		

- Point and percentage ranges for grade calculation:

Grade	Range (%)	Range (points)
A	≥ 89.5	≥ 358
B	79.5 to 89.4	318 to 357
C	69.5 to 79.4	278 to 317
D	59.5 to 69.4	238 to 277
F	≤ 59.4	≤ 237

Grading policies:

- Late assignments are not accepted and will receive a grade of 0, unless you miss the deadline for an excused reason (see below). If you miss an assignment deadline for an excused reason and can provide acceptable written documentation for the absence, you may turn in the assignment upon your return to class (i.e., at the next scheduled class meeting you attend, whether in person or virtually).

- If you miss a mid-term lecture exam for an excused reason (see below), and you provide me with acceptable written documentation for the absence, then your percentage score on the Final Exam will be used to replace the missed exam. Only one exam can be made up this way
- If you miss a lab practical exam for an excused reason (see below), and you provide me with acceptable written documentation for the absence, the score from the other lab practical exam will be used to replace the missed lab practical exam. Only one lab practical exam can be made up this way.
- Excused absences as referred to in this syllabus include the following reasons: serious illness of self or a dependent, death of a close relative, travel or other commitment related to official KSU business (including another course), interviews for graduate or professional programs, military service, jury duty, or closure of the university. Appropriate documentation must be provided. If you can foresee an absence, please contact me as soon as possible ahead of time so we can make arrangements for assignments, exams, or activities you might miss.
- Keep all of your returned, graded work. You must have these materials if you decide to contest your final grade.
- The review period for an exam, during which you can request score corrections related to question content, is 7 days from the time that an exam is returned in class. After this period, you can view your exam but no further changes will be made. Note that score corrections for reasons not related to exam content (e.g., arithmetic error in grading) can be requested at any time up until the date of the final exam.
- Challenges to the content of particular exam questions must be made during the 7 day review period described above. Any challenges should be accompanied by a written explanation of the issue with the question. The explanation should include appropriate documentation (e.g., a recent textbook or journal article citation). One to three sentences per question is usually enough explanation.
- Unless specifically noted otherwise, any material included in lecture, lab activities, or assigned readings are fair game for a lecture exam, lab practical exam, or the final exam. That being said, lab practical exams will be quite narrowly focused on what we did in lab or in virtual lab activities.

Conduct policies:

- Students must abide by the KSU Student Code of Conduct at all times (https://scai.kennesaw.edu/KSU_Codes_of_Conduct_2019-2020.pdf).
- **Disruptive, disrespectful, inappropriate, or unsafe behavior will not be tolerated.** Upon a student's first offense he or she will receive a verbal warning from the instructor. Subsequent occurrences will result in expulsion from the classroom and, depending on severity, referral of the case to appropriate KSU authorities.
- Children may not accompany parents into the classroom without the explicit permission of the instructor. Disruptive children will not be allowed to remain in the classroom.
- Attendance will be taken at each class meeting that you attend. If you arrive after attendance is taken, you must demonstrate your presence to me at the end of the class period or you will be counted absent.

Lab policies

- Please review the laboratory safety guidelines posted here, particularly pages 11-13: <http://ksuweb.kennesaw.edu/~jhendrix/regs/Laboratory%20Handbook%20for%20Faculty.pdf>
- Do not eat or drink anything in the lab. There are no exceptions to this rule.

- Smoking, vaping, or use of any tobacco product is prohibited.
- Wash your hands after leaving the lab.
- You must wear appropriate lab attire: shirt (no bare midriffs or shoulders), long pants or dress/skirt, and closed-toed shoes. Leg coverings (pants or dress/skirt) must reach your shoes (e.g., capri-length pants are not acceptable). Sandals, open-toed shoes, open-heeled shoes, and shorts are not permitted in the lab. **If you are not dressed appropriately for lab then you will be required to leave.**
- Follow all instructions both written and verbal.
- Know the locations of emergency exits, fire extinguishers, eye wash stations, and the first aid kit.

COVID-19 related course policies

- Check the KSU Coronavirus page for up to date information on the university's policies and procedures for responding to the COVID-19 pandemic: <https://coronavirus.kennesaw.edu/>
- Effective July 15, 2020, University System of Georgia (USG) institutions will require all faculty, staff, students, and visitors to wear an appropriate face covering while inside campus facilities/buildings where six feet social distancing may not always be possible. Face covering use will be in addition to and is not a substitute for social distancing.
- Students must maintain social distancing (6 feet) whenever possible.
- Refusal to wear a face covering and/or maintain social distancing will result in you being required to leave the classroom.
- Shared equipment (e.g., microscopes) should be disinfected between students.

Accommodations:

Any student with a documented disability or medical condition needing academic accommodations of class-related activities or schedules must contact the instructor immediately. Written verification from the KSU disabled Student Support Services is required. No requirements exist that accommodations be made prior to completion of this approved University documentation. All discussions will remain confidential.

Academic integrity:

Every KSU student is responsible for upholding the provisions of the Student code of Conduct, as published in the Undergraduate and Graduate catalogs. Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic malicious/intentional misuses of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "Informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.

The Kennesaw State University College of Science and Mathematics encourages our students to use technology to help them learn. However, it is important for students to understand the difference between appropriate collaboration and inappropriate uses of technology for plagiarism and cheating. Students who participate in group texts or other group conversations through mobile apps such as GroupMe or WhatsApp are subject to consequences if any member of that group is found to plagiarize material or facilitate cheating. By virtue of membership in the conversation or participation in the group, any student who is part of a group conversation where cheating or plagiarism occurs may receive the same penalty as students who actively cheat within the group. Additionally, any students who are found

to purchase, sell, or otherwise distribute or collect existing course material are also subject to academic dishonesty hearings. This includes the use of Quizlet, Hero, and student organization test files.

Course modality (official KSU language):

- This is a **Rotational On-site** course delivered in a traditional in-person classroom setting, for a portion of the enrolled students, at scheduled dates and times with the remaining portion of the class participating online via **streaming video**.
- Those students attending in person will be rotated according to a schedule established by the instructor.
- All course content, assignments, and exams taking place after the Thanksgiving break will be delivered online.
- You should be prepared for the possibility of moving the on-site sessions to synchronous or asynchronous online delivery depending upon the status of the ongoing pandemic emergency. For this reason, you should pre-arrange access to stable internet capable of handling streaming video demands and a computer with (internal or external) functioning webcam with microphone.

Course modality (course-specific):

- The **lecture** portion of the course is held in person until Thanksgiving break. After Thanksgiving break, we will meet virtually for all lecture sections.
- The **lab** portion of the course is held on a rotating basis. Each week, half of students will attend lab in-person while the other half of students complete a virtual lab experience. This is done so that every student has the opportunity to experience an in-person invertebrate lab, while allowing everyone to (1) have an invertebrate zoology lab experience every week; and (2) follow social distancing guidelines.

Useful KSU sites:

- COVID-19 information: <https://coronavirus.kennesaw.edu/>
- Academic calendar: <https://registrar.kennesaw.edu/academic-calendars/fall-2020-academic-calendar.php>
- Final exam policies: <https://registrar.kennesaw.edu/academic-calendars/fall-final-exam-schedule.php>

Assignment descriptions

- **Mini-exam:** This is a low-stakes, “practice” exam designed to give you an early sense of what later, larger exams will be like.
- **Lecture exams (including Final Exam):** These are exams designed to evaluate your knowledge and understanding of course material. Some question will test simple recall while others will require synthesis and application of information. Lecture exams consist of a mix of multiple choice, matching, true-false, and short answer/essay questions.
- **Mini-research paper:** This is a writing assignment in which you will address a question of your choosing by reviewing recent literature on the subject. You will also make a short (≈ 5 min.) presentation to the class on your topic. A detailed assignment guide will be handed out during the semester.
- **Lab practical exams:** Practical exams test your ability to put theory into practice through identification of organisms and through interpreting experimental data (as seen in lab activities).

- **Lab notebook:** Your lab notebook is *your* record of your observations in the lab. This will not only give you something more permanent to carry away from this course, but also help you develop a broader understanding of the natural history of the invertebrates, as well as refine your powers of observation. A well-done notebook will help you as you study for your laboratory practical exams. I will check your journal progress (for credit) periodically throughout the semester.
- **Lab assignments:** Five of the lab activities will have assignments that you turn in for credit. Details and due dates for each assignment will be provided when they are assigned.

Schedule

- In the schedule, chapter readings in the Pechenik textbook are given in parentheses after lecture topics. Lecture topics without a textbook reading will have a supplemental reading assigned.
- In the event that the University officially cancels classes on a day when we meet, everything will shift back one class meeting (including exams). If that happens, an updated schedule will be posted on D2L.
- The schedule in this syllabus assumes that the university does not go back into COVID-19 lockdown. If it does, then the schedule will be adapted.

Lab rotation

- Part of the KSU response to COVID-19 is mandating social distancing in all labs and classrooms. As a result, only half of this course's students can be in our teaching lab at any given time.
- At the beginning of the semester you will be assigned to lab group A or B. Groups will be assigned randomly, but you can trade with someone in the other group if you both agree.
- Each week, either group A or B will attend lab in person while the other group completes a take-home lab activity. Both groups will have experienced all of the same activities by the end of the semester.
- Both groups will take the lab practical exams on the same day but at different times. For lab practical exam 1, group A will take the exam from 11:15 am to 12:15 pm, and group B will take the exam from 12:45 pm to 1:45 pm. For lab practical exam 2, the order is reversed. Group B will take the exam from 11:15 am to 12:15 pm, and group A will take the exam from 12:45 pm to 1:45 pm. The lab will be cleaned between groups.

Schedule of topics

Week	Date	Day	Lecture topic(s) (Pechenik chapter)	Lab topics (Thursday)
1	Aug 18	T	Syllabus; Intro to inverts (1)	A: Notebooks/drawing/keys (f2f) B: Cambrian explosion (virtual)
	Aug 20	R	Intro to inverts (1); Invert phylogeny (2)	
2	Aug 25	T	Invert phylogeny (2)	A: Cambrian explosion (virtual)
	Aug 27	R	Protista (3)	B: Notebooks/drawing/keys (f2f)
3	Sept 1	T	Porifera and Placozoans (4)	A: Planaria (f2f)
	Sept 3	R	Lecture Mini-exam	B: Protozoa (virtual)
4	Sept 8	T	Cnidaria (5-6) and Ctenophora (7)	A: Protozoa (virtual)
	Sept 10	R	Platyhelminthes (8)	B: Planaria (f2f)
5	Sept 15	T	Lecture exam 1	A: Mollusca (f2f)
	Sept 17	R	Molluscs 1 (12)	B: Earthworms (virtual)
6	Sept 22	T	Molluscs 2 (12)	A: Earthworms (virtual)
	Sept 24	R	Annelids (13)	B: Mollusca (f2f)
7	Sept 29	T	Arthropods 1 (14)	A: Terrestrial invertebrates (f2f)
	Oct 1	R	Arthropods 2 (14)	B: Stream integrity (virtual)
8	Oct 6	T	Arthropods 3 (14)	A: Stream integrity (virtual)
	Oct 8	R	Mesozoans (9); Gnathifera (10)	B: Terrestrial invertebrates (f2f)
9	Oct 13	T	Gnathifera (10); Nemertea (11)	A and B: Lab practical exam 1
	Oct 15	R	Tardigrades and Onychophorans (15)	
10	Oct 20	T	Lecture exam 2	A: Invertebrate literature search
	Oct 22	R	Nematodes (16); Nematode relatives (17)	B: Marine invertebrates (f2f)
11	Oct 27	T	Nematode relatives (17); Other phyla (18)	A: Marine invertebrates (f2f)
	Oct 29	R	Lophophorates (19)	B: Invertebrate literature search
12	Nov 3	T	Echinoderms 1 (20)	A: Bee foraging (virtual)
	Nov 5	R	Echinoderms 2 (20)	B: Terrestrial ecology (f2f)
13	Nov 10	T	Hemichordates (21)	A: Terrestrial ecology (f2f)
	Nov 12	R	Xenoturbellids (22); Chordata (23)	B: Bee foraging (virtual)
14	Nov 17	T	Invertebrates and human society	A and B: Lab practical exam 2
	Nov 19	R	Invertebrates and human disease	
15	Nov 24	T	No class - Thanksgiving break	
	Nov 26	R		
16	Dec 1	T	Class presentations (virtual)	
	Dec 3	R		
17	Dec 8	T	No class	A and B: Paper due 4:00 PM EST on Thursday December 10
	Dec 10	R	Final exam: 10:30 am - 12:30 pm EST	

Lab rotation: "f2f" is in-person, in lab; "virtual" denotes lab activities done outside of lab. Remember which lab group (A or B) you are assigned to!