

BIO301 INVERTEBRATE ZOOLOGY

Fall 2007

Instructor: Dr. Charles Acosta

Office: SC346

Office hours: T 11-12 & W 2-3

Class: SC165 T&R 1:00-3:50

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Required Text

- Brusca & Brusca, Invertebrates. 2nd edition. Sinauer.

Optional Text

- Wallace & Taylor, Invertebrate Zoology: A Lab Manual. 5th edition. Prentice-Hall.

COURSE OVERVIEW

It may not occur to many of us that invertebrates rule the animal kingdom with more than 1,000,000 described species categorized in 34 Phyla. Vertebrates, the animals we all easily recognize, number about 43,000 species in a single Subphylum but are the subjects of a disproportionate number of college courses (e.g., Ornithology, Mammology, Ichthyology, Herpetology, Human Anatomy, etc.). In this course, we will make a valiant attempt to make up for this egregious oversight by studying 97% of the earth's animal diversity in this single course. The underlying theme of this course is "Unity amidst Diversity" where defined patterns and processes link the vast diversity of animals.

STUDENT LEARNING OUTCOMES

Students will become proficient in:

- comparing growth, respiration, water balance, excretion, movement, reproduction, and development among major invertebrate phyla;
- describing patterns in animal diversity and discuss the evolutionary relationships between taxonomic groups;
- explaining the mechanisms underlying differences in body design and describe how different body designs solve (or create) problems with regard to the animal's natural environment;
- researching current topics and writing essays on our evolving knowledge of zoology;
- discussing how these animals impact our health, our economy, and our environment.

COURSE SYLLABUS

1. Format:

Lecture & Discussion; Laboratory Exercises; Field Trips

2. Grading:

	<u>Lecture</u>		<u>Laboratory</u>	
Exam #1	100	Lab Practical #1	100	
Exam #2	100	Lab Practical #2	100	
Exam #3	100	Lab Practical #3	100	
Final Exam	100			
Independent Research	100			

Grades: The final grade will be given for both Lecture and Lab. Lecture exams missed due to legitimate, certifiable absences must be taken within 48 hours. Make-up Lab exams will not be given.

3. Lecture

You must read the assigned text and lab manual chapters before coming to class. Many additional references will be in the lab; these are not to be removed from the room. Lecture tests will include all topics discussed in class, lab, and field trips.

4. Independent Research Project

Researching, interpreting, and synthesizing information in the primary scientific literature is an essential skill for all students of science or science education. Research involves conducting literature searches in library databases. Interpreting and synthesizing information in a well-referenced report demonstrate your mastery of the topic. A good research paper should be interesting and informative, concise but complete. Topics for term papers will be selected by the students in consultation with the instructor. Students will give a brief Powerpoint presentation and discussion of their topic. Potential topics may cover any aspects of invertebrate biology (systematics, physiology, ecology, evolution, conservation, etc.). The paper itself should be focused on the topic and should be a critical analysis of the topic, not simply a literature review.

Research report format: Reports must be typed, double-spaced on numbered pages. The format should be exactly as outlined below. Reports should be submitted by the due date via Digital Dropbox on Blackboard. Late reports will not be accepted.

- Page 1 title page: **Title, your name, BIO301 Invertebrate Zoology, Northern Kentucky University, Fall 2007** (centered on a single page)
- Page 2 abstract page: **Abstract** (concise summary of the focal topic in 200 words or fewer)
- Page 3 to 8: **Section Headings and Subheadings** (detailed discussion of literature, your interpretation and perceptions)
- Pages as necessary: **Literature Cited** (follow format exactly as in the example review paper)

5. Laboratory

- Laboratory exercises will be taken from the Wallace & Taylor manual, with some modifications.
- Microscopes: A compound microscope and a dissecting microscope (each with an identification number) will be assigned to each student. Students are responsible for maintenance, cleaning, and proper storage of their assigned microscopes.
- Dissections: Students must have a basic dissection kit containing scissors, scalpel, and forceps. Disposable gloves will be provided in lab. Lab coats are optional.
- Cleanup: All students are required to clean up their work area prior to leaving class. This includes washing slides and glassware, proper disposal of used specimens, and cleaning lab benches.
- Safety: Safety in the lab is of the highest priority. Use sharp instruments and chemicals with extreme caution. Broken glass should be discarded only in the appropriate disposal containers. No horseplay will be permitted. Report accidents and injuries immediately. Practice safety.

6. Field Trips

- We will take short field trips to demonstrate sampling methods and to collect local invertebrates in terrestrial and freshwater environments.
- Wear comfortable clothes and covered-toe shoes (no flip-flops or sandals) during field trips. Bring drinking water with you. Use sunscreen lotion and wear a hat if necessary.

GENERAL RULES & PROCEDURES

- Students are required to read and abide by the University Honor Code and other information described in the Code of Student Rights & Responsibilities at the following website:
<http://www.nku.edu/~deanstudents/policies.htm>
- Students with disabilities should review the information on available resources and accommodations at the following website:
<http://www.nku.edu/~disability/>
- Important dates
 - **September 10, 2007:** last date to drop the course.
 - **October 29, 2007:** last date for withdrawal from the course with a "W" grade.

BIO301 Invertebrate Zoology Tentative Schedule Fall 2007

Date		Lecture	Chapter	Laboratory
Aug	21	Evolution; Biodiversity; Classification; Environments	1; 2	Orientation
	23	Animal body plans	3	Microscopy
	28	Protozoa	5	Protists FIELD: Aquatic habitat
	30	Protozoa	5	Protists
Sep	4	LECTURE EXAM 1		
	6	Development & Origins;	4	Embryos
	11	Parazoa; 1. Phylum Porifera	6	Sponges FIELD: Terrestrial habitat
	13	Mesozoa	7	FIELD: Terrestrial habitat
	18	Metazoa; 2. Phylum Cnidaria	8	Cnidarians
	20	Ctenophores	9	LAB PRACTICAL 1
	25	Protostome evolution; 3. Phylum Platyhelminthes	10	Trematodes; Cestodes
	27	Phylum Platyhelminthes	10	Turbellarians
Oct	2	Nemertean; 4. Phylum Nematoda	11; 12	Nematodes
	4	Blastocoelomates	11	Acanthocephalans; Rotifers
	9			FIELD: Aquatic habitat
	11	5. Phylum Annelida	13	Earthworms; Polychaetes; Leeches
	16	-- Fall Break --		
	18	Lesser coelomates; LECTURE EXAM 2	14	Sipunculids; Echiurans
	23	Onychophora; Tardigrada;	15	LAB PRACTICAL 2
	25	6. Phylum Arthropoda	15	Onychophorans; Tardigrades; Trilobites
	30	Phylum Arthropoda	16	Crustaceans
Nov	1	Phylum Arthropoda	16	Crustaceans
	6	Phylum Arthropoda	17	Insects
	8	Phylum Arthropoda	17	Insects
	13	Phylum Arthropoda	18; 19	Myriapods; Horseshoe crabs; Arachnids; Pycnogonids
	15	7. Phylum Mollusca	20	Gastropods; Polyplacophorans; Scaphopods
	20	Phylum Mollusca; Lophophorates	20; 21	Bivalves; Cephalopods; Bryozoans
	22	-- Thanksgiving Holiday --		
	27	Deuterostome evolution; LECTURE EXAM 3		
	29	8. Phylum Echinodermata	22	Starfish; Urchins; Sea cucumbers
Dec	4	Hemichordates; Chaetognaths; 9. Phylum Chordata	23	Arrow worms; Tunicates; Lancelets
	6	Review; Research Papers due; Presentations		LAB PRACTICAL 3
	11	FINAL EXAM (1:00-3:00)		