Animal Biodiversity
BIOL 2073/2070L WI01

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Lecture: M/W/F, BAC 244, 10:30 AM - 11:20 AM

Lab: BIO 210
WI01: T 8:30 AM - 11:20 AM
WI02: T 1:00 PM - 3:50 PM
WI03: W 1:00 PM - 3:50 PM
WI04: Th 1:00 PM - 3:50 PM
WI05: F 1:00 PM - 3:50 PM

Evaluation	Percentage	Date
Quiz 1	2	Opens Jan 17
Quiz 2	2.5	Opens Jan 31
Midterm 1	**18**	**Feb 7**
Quiz 3	2.5	Opens Feb 14
Quiz 4	2.5	Opens Mar 7
Midterm 2	**18**	**March 14**
Quiz 5	2.5	Opens Mar 28
Final Exam	**22**	**TBA during exam period**
Laboratory assignments	30	Due biweekly, throughout term

Part 1: Course Information

Course Description

An introduction to the diversity, evolution, structure, and function of vertebrates, invertebrates, and non-photosynthetic protista. The main objective of this course is to introduce students to major groups and demonstrate the variety of relationships within, as well as between, these groups of organisms. (3h lab).

Prerequisite(s): BIOL 1113/BIOL 1123 with a minimum grade of C-; BIOL 2073 may be taken concurrently with BIOL 1113/BIOL 1123 with permission of the Department.

Course Materials & Requirements

Access to course ACORN page, lab coat

Recommended Text: Integrated Principles of Zoology, 18th edition, by Hickman CP, Keen SL, Eisenhour DJ, Larson A, I'Anson H, McGraw Hill Companies Inc. 2020

Course Structure

Lecture material will be presented as 50-min Monday, Wednesday, and Friday from 10:30 to 11:20 am in Beveridge Arts Centre (BAC) 244 (see part 2 for the lecture schedule).

Labs 3 hours biweekly in BIO 210 during the following weeks: Jan 21-24, Feb 4-Feb 7, Feb 25-28, March 11-14, and March 25-28.

Note: No classes/labs Feb 17-21 (Winter study week)

Student Learning Outcomes

1. Understand the diversity of all major groups, and some minor groups, of animals

2. Understand structural features of major groups of animals, with an emphasis on comparison of these features among members of these groups
3. Understand the functions of various body systems featured by major groups of animals, with an emphasis on comparison of these features among members of these groups
4. Understand the role of animals in environments and their role in food webs
5. Understand the interactions of animals with other animals, including predation, parasitism, and cooperation, and with other organisms in ecosystems
6. Become proficient in examining and dissecting preserved animals to identify important structural features
7. Identify common species of animals and determine in which major group they belong

How to Meet the Learning Outcomes

1. Reading the relevant topics in the textbook before each lecture, and attending all lectures
2. Taking notes during lecture and asking for clarification in lecture or during office hours if you are unsure of material
3. Studying on a regular basis: for each hour of lecture, students should spend at least one hour rereading or rewriting lecture notes, and reviewing and studying material for tests
4. Preparing for, attending, and actively participating in all labs

Part 2: Course Plan

The instructor reserves the right to amend the course plan with reasonable notice, and in consultation with the class.

Lecture:

List of lecture topics (chapters refer to Hickman textbook) topics subject to change based on pace of instruction.

Date	Lecture	Topic
January 6	1	Introduction to Animal Biodiversity
January 8	2	Reproduction (Ch. 7)
January 10	3	Principles of development (Ch. 8)
January 13	4	Architectural pattern of an animal (Ch. 9)
January 15	5	Taxonomy and phylogeny of animals (Ch. 10)
January 17	6	Protists (Ch. 11)
January 20	7	Sponges (Ch. 12)
January 22	8	Radiate animals (Ch. 13)
January 24	9	Flatworms (Ch. 14)
January 27	10	Molluscs (Ch. 16)
January 29	11	Annelids (Ch. 17)
January 31	12	Nematodes (Ch. 18)
February 3	13	Introduction to arthropods (Ch. 19)
February 5	14	Crustaceans (Ch. 20)
February 7	15	**Midterm 1**

February 10	16	Insects (Ch. 21)
February 12	17	Echinoderms (Ch. 22)
February 14	18	Introduction to chordates (Ch. 23)
February 17	-	HERITAGE DAY
February 19	-	READING WEEK
February 21	-	READING WEEK
February 24	19	Fishes (Ch. 24)
February 26	20	Amphibians (Ch. 25)
February 28	21	Reptilian vertebrates (Ch. 26)
March 3	22	Birds (Ch. 27)
March 5	23	Mammals (Ch. 28)
March 7	24	Integument and skeletal systems (Ch. 29)
March 10	25	Muscular systems (Ch. 29)
March 12	26	Osmotic regulation, excretory systems, temperature regulation (Ch. 30)
March 14	27	**Midterm 2**
March 17	28	Circulatory systems (Ch. 31)
March 19	29	Respiratory systems (Ch. 31)
March 21	30	Feeding and nutrition (Ch. 32)
March 24	31	Digestive systems (Ch. 32)
March 26	32	Nervous systems (Ch. 33)
March 28	33	Sense organs (Ch. 33)
March 31	34	Endocrine system (Ch. 34)
April 2	35	Hormones of metabolism (Ch. 35)
April 4	36	Hormones continued (Ch. 35)

Lab:

Lab 1 (Jan 21-24): Animal cells and tissue types
Lab 2 (Feb 4-7): Taxonomy and phylogeny, animal body plans
Lab 3 (Feb 25-28): Porifera, Cnidaria and Lophotrochozoans (Platyhelminthes, Annelida, Mollusca)
Lab 4 (March 11-14): Ecdysozoa and Echinodermata
Lab 5 (March 25-28): Chordata

Note:

- All students require a lab coat for labs 3 & 4, protective eyewear is also recommended for dissections
- Dissection tools will be provided
- Fresh and preserved specimens will be used in lab: **if you have allergies (particularly to shellfish) or other concerns relating to dissections**, please let the instructor know before lab 2 so accommodations can be made

Part 3: Assessment and Grading

Lecture: The lecture materials will be assessed with two midterm exams, one final exam, and five quizzes throughout the term. **Quizzes** are take-home and open-book with multiple attempts allowed – these are mainly a tool to use to practice for upcoming exams with similar questions. **Exams** are closed book and in class.

Lab (30% of course grade):

- 5% per lab* 5 = 25% (lab hand-ins, 1 scientific drawing), 5% for lab term project; No lab exam
- For Biology courses with labs, **you are required to pass the lab to pass the course**

Part 4: Course Policies

1. PowerPoint slides for each lecture are posted on ACORN before class
   - Download or print off slides, take supplementary notes during lecture
   - Research has shown that students who take notes by hand perform significantly better in situations that evaluate their ability to retain information
2. Not all the information in the lecture is included on slides
   - You are expected to attend every lecture in person whenever possible; please do not skip lectures, or you will miss material that I provide verbally (i.e., not on slides)
3. When using electronic devices during lectures, limit their use to classroom material only
4. Use of artificial intelligence tools by students to assist with their learning is allowed only if:
   - Prior permission has been given by the course professor/instructor, and
   - The student properly credits/cites how the AI technology was used in their work

AI must be used in an ethical and responsible manner as a positive learning tool. AI may not be used in ways that violate Acadia's Academic Integrity Policy. Students are reminded that plagiarism, or other forms of cheating, are both types of academic dishonesty.

Part 5: University Policies

University policies are available in the Acadia University Academic Calendar or through the Registrar's website: https://registrar.acadiau.ca/welcometotheregistrarsoffice.html

Equity, Diversity and Inclusion

Acadia University is committed to becoming a culturally safe and anti-oppressive community. This can only be achieved where there are simultaneous efforts to eliminate all forms of discrimination and harassment from our campus community, including the elimination of all discrimination, harassment and violence based on one's identity, including but not limited to, gender, race, class, ethnicity, sexual orientation, disability, gender identity, gender expression, and Indigeneity. The policy against harassment and discrimination, and resources for students who believe they may have experienced, or witnessed, discrimination or harassment, are available here: https://www2.acadiau.ca/student-life/equity-judicial/equity.html

Last Drop Day

Last day to drop a course and receive a "W". Please check the Acadia University calendar dates, which are available here: https://registrar.acadiau.ca/AcademicCalendars.html

Inform Your Instructor of Accommodations

Acadia University is dedicated to improving access to campus life for all students with disabilities. While we attempt to ensure that all courses are accessible, we recognize that there are barriers that need to be addressed on an individual basis. Students who require accommodations to complete coursework or otherwise fully participate in class should contact Accessible Learning Services directly as soon as possible. https://www2.acadiau.ca/student-life/accessiblelearning.html

The Use of Animals in Teaching and Research

The use of animals in teaching and research at Acadia University is done in accordance with guidelines on the care and use of animals published by the Canadian Council on Animal Care (CCAC). For more information on the CCAC, please visit their website at http://www.ccac.ca

Commitment to Integrity

It is standard practice in Biology to check exams and assignments for cheating and plagiarism. Cheating in the class and/or lab, including plagiarism, will not be tolerated. Please read the appropriate sections of the current Acadia University Academic Calendar: https://registrar.acadiau.ca/AcademicCalendars.html

Information on copy-write and course content from Acadia University is available through the Vaughan Memorial Library: http://libguides.acadiau.ca/c.php?g=433650&p=5027078

The spoken and written course content (including the syllabus, handouts, lectures, presentations, labs, assignments, quizzes, tests, and exams) are the intellectual property of the instructor and may only be copied for personal use. Sharing these materials or uploading them where they may be accessed by others is a violation of copyright. If you wish to make audio, video, or photographic recordings in class, you must first obtain the consent of the instructor and of any other persons (e.g., guest speakers, other students) who may be captured in such recordings. In the case of personal use by students with disabilities, the instructor's consent shall not be unreasonably withheld.

Share the Air Policy – PDF on HR website

Acadia is a scent-free and smoke-free campus. Everyone on campus should refrain from wearing scented products such as perfume/cologne/after-shave/hair spray etc. Violation of this policy could lead to your removal from class/lab/tutorial and potential academic penalties because of missed work.

Part 6: Program Learning Outcomes

Foundations of knowledge		**Course specific examples**	**Proficiency** 1-Introduction 2-Reinforcement 3-Proficient
Scientific method, inquiry and hypothesis testing	Find, understand, and apply information from the literature; understand how to use the scientific method to examine problems from different perspectives		1
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries		1
Biodiversity and ecology	Understand the genetic, taxonomic and ecosystem levels of biodiversity; focus on SW Nova including the Wabanaki Forest and Bay of Fundy ecosystems	Lab science communication project on animal biodiversity topic, overview of animal taxonomy in lab using local species for dissection and observation; lecture material covers taxonomy with intro to ecology of the animals	2
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Lecture material covers evolutionary relationships between animals	2
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	Lecture material introduces concepts of immunity, disease transmission among animals	1
Lab and field skills			
Experimental design	Gain experience in applying the scientific method		NA

Safety	Work safely and productively in lab and field settings	Safety protocols related to WHMIS and dissections (CCAC)	
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	Microscopy (compound and dissection scopes), dissections, scientific drawing, dichotomous keys	2
Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change		NA
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature		NA
Statistical analysis	Use R and or other programs to analyze biological data		NA
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity, and understand the principles of EDI in science	Respectful participation in lab and classroom activities, CCAC (use of animals in science)	2
Collaboration and group work	Work effectively in groups within and across disciplines	Group work on science communication project for lab, lab partners for dissections and observations	2
Critical thinking	Analyze and evaluate information to make science-based decisions	Observation and hypothesis texting in lab	2
Computer proficiency	Use common and discipline- specific software		NA
Scientific communication	Communicate science effectively to both scientific and general audiences	Lab science communication project on animal biodiversity topic	2