Histology 1
BIOL 3423WI01

Lectures: Dr. Glenys Gibson (she/her/hers)
Hear my name

Office: BIO 302
Office hours: M, F 2:00-4:00 PM**
E-mail: glenys.gibson@acadiau.ca
** Or by appointment. Office hours can be in person or on Teams.

Lecture: KCIC 014, MWF 11:30-12:20
Lab: BIO 240, Th 1:00-3:50 PM

Evaluation	Percentage	Date
Two midterms	20% each (40% total)	February 3, March 3
Final exam	30%	April exam period
Four lab quizzes	3.75% each (15% total)	January 29, February 12, March 12, March 31
Project- lab report	10%	March 28
Project- presentations	5%	April 2, 3 and 4

Part 1: Course Information

Course Description

This course examines the cells, tissues and organs of vertebrate animals, with emphasis on structure, function, development and repair. Histo 1 (fall term) focuses on tissue types, the central nervous system and the cardiovascular system. Histo 2 (offered in alternate years) considers the other organ systems.

Lectures and labs are completely integrated. Labs are used to illustrate and support lecture material. The labs are designed to help you retain content learned in the lectures, plus they also provide you with a comprehensive, applied understanding of vertebrate tissues.

The course is broken into three modules, each with a written assessment (two midterms, one final exam). The modules are: 1) epithelium to cartilage, 2) bone to muscle, and 3) nerve to cardiovascular system. Lecture exams are scheduled to occur after the relevant labs, to help reinforce content, but they are on content covered in lectures and associated readings.

Prerequisite BIOL 2013 with at least a C- (60%)

Course Materials & Requirements

Access to course Moodle page and Vaughn Memorial Library's Biology LibGuide

Free online texts are posted on the course page on Moodle. I have a variety of printed textbooks- if you'd like to borrow one (short term) let me know.

Lab handouts will be available on MOODLE before the lab.

Course Structure

Lectures will take place Monday, Wednesday and Fridays from 11:30AM-12:20AM. Please check Self Service/

Course Catalogue for the location.

Labs will be held on Thursday afternoons (1-3:50 PM) in BIO 240.

Student Learning Outcomes

1. Understand the basic tissue types of the vertebrate body (epithelium, connective tissues, muscle and nerve), as well as the histology of the nervous and cardiovascular systems.
2. Identify cells, tissues and some organs on histological slides, and be able to recognize how tissues may change with disease.
3. Become proficient with bright field microscopy. Learn the basics techniques of histology and histochemistry by making slides.
4. Explain how tissue structure changes throughout our lives, from formation in early embryos, routine changes with growth, and aging.
5. Develop professional skills such as the ability to explain major concepts in written format and the ability to write a lab report on histology.

Also see Appendix 1.

How to Meet the Learning Outcomes

1. Education is not a spectator sport. Attend lectures, take notes, ask questions. Please note- I will not be live streaming or recording lectures. If you are feeling sick, stay at home. Get the notes from someone in class and once you've reviewed them and the lecture slides (available on MOODLE), please ask if you have any questions and I'll be happy to help you.
2. Participate in class discussions and group work. Simply discussing what you just learned is an excellent way to remember the material and to learn to apply key concepts in new ways.
3. Labs reinforce lecture content and provide a wonderful opportunity for you to learn about tissues, microscopes, and histochemistry. The labs are designed to reinforce lecture material, so please take advantage of that time.
4. In the lab, make your observations first, make drawings (trust me), then take pictures. **Photos help but only when you know what you are looking at.** Help each other out- everyone's slides are a little different (animal tissues are that way) so please chat with and review slides with your lab partner during the lab.

Part 2: Course Plan

I will do my best to follow the course plan below, but I also reserve the right to amend the course plan with reasonable notice, and in consultation with the class, if needed. Lecture slides and lab handouts will be available on MOODLE.

Week	Lecture	Laboratory	Histochemistry
Jan. 6-10	Module 1: Epithelium, Classification, Modifications	-	
Jan. 13-17	Polarity, Basement Membrane. Module 2: Connective Tissue Proper, Classification	Lab 1: Epithelium	
Jan. 20-24	Fibers, ECM, Cells, Adipose	Lab 2: CT Proper	Sectioning

Jan. 27-31	Module 3: Cartilage, bone Jan. 29- **1st Lab Quiz** (epithelium and connective tissue proper; in lecture period).	Lab 3: Cartilage	Sectioning
Feb. 3-7	Feb. 3- **1st Midterm** (Epithelium to Cartilage). Bone & osteogenesis, blood	Lab 4: Bone	Sectioning
Feb. 10-14	Blood & hematopoiesis Feb. 12- **2nd Lab Quiz** (cartilage, bone; in lecture period).	Lab 5: Blood	
Feb. 17-21	Heritage Day and Reading Week; no lectures or labs	-	
Feb. 24-28	Module 4: Muscle	Lab 6: Muscle and integument	
March 3-7	March 3- **2nd Midterm** (Bone, Blood and Muscle) Module 5: Nervous tissue	Lab 7	Stain slides
March 10-14	Neuroglia March 12- **3rd lab quiz** (blood, muscle, integument; in lecture period). Module 6: Central Nervous System	Lab 8: Nerve, glia	Observe own slides
March 17-21	CNS, Meninges Module 7: Cardiovascular system	Lab 9: CNS	Observe own slides
March 24-28	Arteries, capillaries, veins, heart.	Lab 10: Cardiovascular system	Observe own slides
March 31-April 4	March 31- **4th lab quiz** (nerve, glia, CNS, cardiovascular system; in lecture) Heart **April 2, 4- Presentations** (histochemistry projects)	Lab 11	**April 3- Presentations** (histochemistry projects)

Part 3: Assessment and Grading

Lectures:

1) Midterms. The midterms will be in a short answer (~ 1 paragraph) format, and there will be choice.

2) Final exam. The final will have two parts. Part A will be the same format as the midterms and will be only on the final third of the lecture content. Part B will be an essay and will be cumulative. Near the end of the term, I will ask you to pick over-arching themes we've discussed all term. You will have a chance to vote on the top three themes, I'll craft each of them into a question, and give you the question to think about before the final. This way, you have a chance to review all of the material, but only have to study the parts that you choose to include in the essay. You must write your own, original essay on the final.

Labs: **You are required to pass the lab to pass the course.**

1) Lab quizzes. There will be four lab quizzes throughout the term. Some will be in the lecture period and some in the lab period (and I'll tell you beforehand), and will have questions from the previous two to

three labs. They are not cumulative. I'll project micrographs on the screen, and you will have 1.5 minutes to answer the related question. It's a lot more time than you think- don't worry.

2) Histochemistry project. You and your lab partner will have an opportunity to learn the basics of histology and histochemistry (i.e., the chemistry of staining tissues) by making your own slides. Various organs have already been fixed and embedded in paraffin. Your project involves: sectioning, using a few different stains to visualize different components of the tissues, taking micrographs, and writing up a short assignment.

Assessment: The assignment will include your labelled micrographs and a short interpretation of what the stain tells you about the tissue structure (10%). You and your partner will also present your slides to the class in a 10 min presentation at the end of the term (5%).

Part 4: Course Policies

Students are expected to attend all class sessions as listed above. If you are unable to do so for a valid reason, please let me know. You are responsible for getting the notes from another student in the lecture. Each class, we'll be having small group discussions. Participating in these will help you learn, help you retain, and help you prepare for the exams.

Attendance in labs is mandatory. If you have to miss a scheduled lab, please let me know in advance. For the histochemistry project, it will be difficult to make up a lab. It's doable, but these labs take a lot of set up- please talk with me about a potential missed lab in advance.

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. In this course, use of AI to do assignments, exams, etc. is not permitted; you are expected to submit your own, original work. 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.

Part 6: Program Learning Outcomes

The Biology Department maps Program Learning Outcomes (PLOs) in each course throughout our program in order to identify where learners develop *Foundations of Knowledge*, *Lab and Field Skills*, and *Professional Skills*, and to align content and skills across courses.

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	Laboratory project on tissue structure using histochemistry; literature use and citations	3
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Some key histologists are introduced	2
Biodiversity and ecology	Understand the genetic, taxonomic and ecosystem levels of biodiversity; focus on SW Nova including the Acadian Forest and Bay of Fundy ecosystems		
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Role of genetics, transcription factors and environment in building and remodeling tissues	2
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	Tissue structure and function, development, renewal, ageing and pathology	3
Lab and field skills			
Experimental design	Gain experience in applying the scientific method	Introduced in the histochemistry project	2
Safety	Work safely and productively in lab and field settings	Safe lab practices	2
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	Microscopy, imaging, histochemistry	3

Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change		
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature	Qualitative descriptions, micrographs, image adjustments, preparation of publication-quality plates.	3
Statistical analysis	Use R and or other programs to analyze biological data		
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity, and understand the principles of EDI in science	EDI and ethical conduct of historical figures discussed in lecture; students follow principles of academic integrity throughout.	3
Collaboration and group work	Work effectively in groups within and across disciplines	Group work in lecture and lab; team-based work in projects	3
Critical thinking	Analyze and evaluate information to make science-based decisions	Applied questions in lecture and on midterms; apply concepts in new scenarios.	3
Computer proficiency	Use common and discipline- specific software	MS suite, microscopy, image capture and manipulation	3
Scientific communication	Communicate science effectively to both scientific and general audiences	Oral communication in group work and in formal presentation; written in lab reports and on exams with short answers and essay questions.	3