One Health
BIOL 4193 FA01

Instructor: Laura Ferguson (she/her)
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Lecture: T/Th 11-12:20
Location: BAC 235

Evaluation	Percentage	Date
Proposal outline	10	October 1st
Oral progress report	10	October 21-25
Final presentation	15	November 28-Dec3
Final report submission	40	November 28
Final exam	15	Take home (due Dec 17th)
Participation	10	Throughout term (e.g. in-class discussions, assessed by peers in group work)

Part 1: Course Information

Course Description

Health is […] not merely the absence of disease – WHO
It is not 'natural' to talk about land and people without each other or the health of one without the health of the other – Joe Copper Jack

The health of humans, animals, and the environment are inextricably linked. One cannot flourish without the health of the other. In this course we seek to understand the mechanisms underlying the connections between human, animal, and environmental health – ecological, physiological, and evolutionary – such that we can explain *how* and *why* the One Health approach is functional. We will work to determine how this mechanistic understanding and the One Health approach allows us to tackle the major challenges that face life on earth (e.g. biodiversity loss, emerging zoonoses, climate change, antibiotic resistance, etc). This course is designed to reunite our students focused more towards Ecology and Wildlife with those who lean towards Health Sciences and Veterinary Medicine to share perspectives and ideas. Ultimately, these fields – and the future of life on earth – are linked together and we use this course to explore our various, collaborative roles as biologists.

In each unit we will emphasize:

1. How we conduct research: what do we need to measure? How do we measure these variables? Who do we need to collaborate with to gain a holistic understanding of the problem and solution?
2. What would a One Health approach to these challenges entail? What are the benefits and drawbacks of this approach compared to others?

Prerequisite(s): BIOL 1113/1123 (eventually: BIOL 2073, BIOL 2013)

Course Materials & Requirements

There is no required textbook for this course. We will build a database of readings throughout the term.

Course Structure

The course will combine traditional lectures with outside-of-class reading and in-class discussion. You will often be expected to read a document or paper before attending class and then participate in class discussion or activities. There is no lab component. There will be several guest lectures from a variety of different disciplines (e.g. politics, economics, social science, those working directly in One Health). There will be time spent both in class and outside of the classroom working collaboratively on term-long group project.

Student Learning Outcomes

1. Explain the functional foundation underlying the concept of One Health
2. Apply a One Health perspective to emerging local and global challenges
3. Gain experience working collaboratively across disciplines and perspectives
4. Develop an understanding of your role as a biologist

How to Meet the Learning Outcomes

1. Attend class
2. Participate in group discussions
3. Maintain a calendar and get started early on your project!
4. Organize your term project to take advantage of each other's strengths
5. Check your email and ACORN regularly. I use these to communicate with you about deadlines, updates to classes and labs, etc.
6. Communicate with me in advance or as close to a missed deadline as possible. I am flexible, but meet me halfway!

Part 2: Course Plan

The instructor reserves the right to amend the course plan with reasonable notice, and in consultation with the class. The pace of instruction, dates of guest lectures, and direction of class discussions will dictate how and when we move through the material.

Lecture:

Unit	Topics	Dates
1: Basics underlying One Health	What is 'Health'? Why "One Health"? Evolution as a foundation for biology in One Health Ecology and Biodiversity refresher Indigenous knowledge in One Health (Land and People's Relationship Model)	Week 1,2
2. Pandemics and Zoonoses	Emerging infectious diseases/zoonotic diseases Biodiversity and spillover Vector-borne disease Neglected tropical diseases	Weeks 3,4
3. Antibiotic Resistance	Microbial evolution Overuse in livestock & humans Resistant bacteria in wildlife and ecosystems	Weeks 5,6
4. Ecosystem health: water, air, soil	Major challenges and impacts on ecosystems Pollution & Protection: One Health approaches	Weeks 6,7
5. Human-animal bonds	Risks & rewards	Week 8
6. Emerging topics in One Health	Microbiomes	Week 9
7. Human-environment connection	Why do we benefit from exposure to nature?	Weeks 10/11

	Harnessing for conservation Use of wild spaces for human health	
8. Science communication and misinformation	Spotting misinformation and pseudoscience Effective communication	Week 12
9. Equity, Diversity, and Inclusion in One Health	At risk communities and environmental justice	Week 12

Part 3: Assessment and Grading

The majority of your grading is based around a semester-long group project report on One Health. You will be assessed along the way to provide feedback and opportunities for improvement. This project will be based on identifying local challenges that require a One Health approach, and how to apply this approach. You will be expected to engage fellow students, professors, or community members in your report. You will work collaboratively as a team drawing on each other's strengths to produce the report. You will prepare a written proposal, oral progress report, final written report, and short final presentation on your final report. There is a take-home final. A portion of your grade is also based on attendance and participation (10%).

Part 4: Course Policies

While your primary objective is to be in class and learning, we certainly all recognize that life happens outside of school as well and you may encounter a variety of challenges throughout the term. We can work together to accommodate illness, etc. Contact me as early as possible for any possible conflicts in dates. Generally, our class policy is to be respectful of everyone in our class and put effort into your participation and projects!

Students are expected to submit work that reflects their own ideas and engagement with the readings as well as their writing ability. Engaging with the work of others is an important part of academic writing. All ideas and quotations borrowed from other sources must be carefully cited and we use the citation style from the *Journal of Experimental Biology* or another approved citation style. Students may not use generative AI, such as Chat GPT, or paraphrasing software, such as QuillBot, to help them complete assignments. In this course, the use of generative AI or paraphrasing software, even with citation, constitutes cheating.

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.

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	Identifying experimental needs and designing experiments to address One health challenges	3
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Land and People's Relationship Model	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	Re-exploring and applying foundational concepts to understand why One Health works	2
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Re-exploring and applying foundational concepts to understand why One Health works	2
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	Curriculum based on understanding and applying this framework	3
Lab and field skills			
Experimental design	Gain experience in applying the scientific method	Identifying experimental needs and designing experiments to address One health challenges	3
Safety	Work safely and productively in lab and field settings	NA	
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	NA	
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	Unit on EDI; addressing EDI in final reports	2
Collaboration and group work	Work effectively in groups within and across disciplines	Term group project	3
Critical thinking	Analyze and evaluate information to make science-based decisions	Term project report on scientific needs to address local One Health challenges	3
Computer proficiency	Use common and discipline- specific software	Powerpoint, Word	2
Scientific communication	Communicate science effectively to both scientific and general audiences	Unit on effective communication and misinformation	2