

Course ID:	Course Title:	Fall 2023
BIO 495	Independent Research Project in Biology	Prerequisite: 15 credits of relevant senior courses in BIO, BCH, or ZOO
		Credits: 3

Class Information		Instructor Information		Important Dates	
Delivery:	Research, weekly meetings	Instructor:	Matthew Morris, PhD, MSc, BSc (Hnrs Co-op), BRE	First Day of Class:	Sept 6
Days:	F	Email:	Matthew.Morris@ambrose.edu	Last Day to Add/Drop:	Sept 17
Time:	1:00-2:15	Phone:	403-410-2000 ext 6932	Last Day to Withdraw:	Nov 20
Room:	A2158	Office:	A2158	Last Day to Apply for Coursework Extension:	Nov 23
Lab/Tutorial:		Office Hours:	by request	Last Day of Class:	Dec 11
Final Exam:					

### Important Dates and Information

For a list of all important dates and information regarding participating in classes at Ambrose University, please refer to the Academic Calendar at <https://ambrose.edu/academic-calendar>.

### Course Description

This course is the first course of a two-semester biology research project. Students will choose a research topic of choice, conduct a literature review, and write a research proposal identifying a new research question and describing an experimental protocol.

### Textbooks

None

## Learning Outcomes:

1. **Research Topic Selection:** By the end of this course, students will be able to choose a specific and relevant research topic within the field of biology that interests them and aligns with instructor's interests.
2. **Literature Review:** Students will demonstrate the ability to conduct a comprehensive literature review, identifying key research papers, relevant theories, and existing gaps in knowledge related to their chosen research topic.
3. **Research Question Formulation:** Students will formulate a clear and concise research question based on the literature review, demonstrating their understanding of the existing knowledge in the chosen field.
4. **Hypothesis Development:** Upon completion of the course, students will be able to develop a testable hypothesis that addresses their research question and is grounded in scientific principles.
5. **Experimental Design:** Students will design an appropriate and well-structured experimental protocol that aligns with their research question and hypothesis. This includes selecting relevant variables, controls, and data collection methods.
6. **Ethical Considerations:** By the end of the semester, students will be able to identify and discuss ethical considerations related to their proposed research, including animal or human subject concerns, and develop strategies to address them.
7. **Research Proposal Writing:** Students will produce a high-quality research proposal that includes a clear introduction, literature review, research question, hypothesis, experimental design, and a discussion of potential outcomes.
8. **Critical Thinking:** Through engaging with complex scientific literature and research design, students will enhance their critical thinking skills, enabling them to evaluate and analyze scientific information effectively.
9. **Communication Skills:** Students will improve their ability to communicate scientific ideas in writing, through regular progress reports.
10. **Time Management:** By successfully managing their research project, students will develop effective time management skills, ensuring they meet project milestones and deadlines.

## Course Schedule

The schedule will be loose, but will require the following:

- i. Approximately 80 hours of work across the semester
- ii. Weekly one-hour meetings with the instructor, to:
  - a. report on findings thus far
  - b. discuss methodologies
  - c. report on work to do the following week
  - d. discuss key papers and/or questions related to the project

## Requirements:

1. Use of taxonomic keys – identify two unknown species of fish, documenting the logical use of keys that was employed. – 5%
2. Literature review on Alberta’s catostomids, with an emphasis on *Catostomus* and *Pantosteus* – 30%
3. Updated map on species distributions – 15%
4. Experimental proposal, 10-20 pg – first draft, ungraded
  - a. Introduction (lit review)
  - b. Materials and Methods (proposed)
  - c. Expected results
  - d. Why this project matters
5. Second draft of experimental proposal, graded - 35%
6. Participation and care of lab equipment/specimens, including collection and storage of raw data – 15%

## Attendance:

There are no set hours for this class. However, the expectation is 80 hours of work will be conducted throughout the semester, including weekly meetings.

Note that it is the student’s responsibility to notify the instructor before conducting lab work, so that the instructor can be present or available in case of emergency. Also note that the labs are in use throughout the semester – students will need to arrange their schedule such that they can make use of the labs when the labs are not in use (if need be).

## Late assignment policies

Homework or lab assignments cannot be submitted late without cause and approval from the professor. Homework assigned during lecture is **due at the start of lecture** for which it is due; anything after the start of lecture will be considered late. Lab assignments not due at the end of the lab period in which the work is done **are due at the beginning of the next lab period**; anything after the start of the lab will be considered late. The penalty for late homework or lab assignments are as follows:

Issue	Communicated to professor or lab instructor in advance?	Penalty
Late by 5 min – 7 days	Yes	5% deducted per day
Late by 5 min – 7 days	No	10% deducted per day
Late by >7 days	-	0 on assignment
No name on assignment	-	0 on assignment

Assignments officially receiving a grade of 0 as a penalty will still be “graded” so that you can have feedback before the exam, even if your official grade is 0.

Missed midterms or final exams, without cause, cannot be made up.

### Use of artificial intelligence (AI)

In this class, you will be conducting a variety of written assignments, including an experimental report. All work should be your own. Use of AI-generated text or images is not permitted and will be considered an example of plagiarism (see policy below). For this reason, written assignments will be submitted through Moodle and assessed for AI content and other forms of plagiarism via Turnitin.

### Plagiarism policy

Consult the Academic Calendar for Ambrose's position on plagiarism and its consequences. In brief, it is your responsibility as a citizen of Ambrose to be aware of the policies of Ambrose and abide by them. Ignorance is no excuse. Plagiarism will not be tolerated.

Examples of plagiarism include, but are not limited, to:

1. Copying an assignment from someone else and submitting it as your own work.
2. Working with a friend and writing down identical answers, whether you understand the content or not, and submitting the assignments separately.
3. Quoting directly from a source without supplying quotation marks or a citation.
4. Quoting directly from a source without supplying quotation marks, even if it is referenced.
5. Copying nearly word-for-word from a source, changing only the occasional word, without providing quotation marks, even if it is referenced.
6. Submitting an assignment in which >30% of the content is properly quoted; that is, at least 70% of the words in an assignment need to be your own. A general rule of thumb: for every line quoted, there should be three lines of your own material explaining that quote.
7. Submitting the same or similar assignment for more than one class, or more than one iteration of the same class.
8. Not citing illustrations used in a paper.
9. Submitted AI-generated content as your own.

### Penalties for plagiarism

Offence	Consequence
First	0% on assignment, no chance to resubmit; report on academic misconduct filed with the registrar
Second	F in course; report on academic misconduct filed with the registrar
Third	F in course and recommendation to registrar for expulsion; report on academic misconduct filed with the registrar

Note that Ambrose has an appeals process in place if you feel that allegations of plagiarism are unfounded; these are for final marks only, and not for individual assignments.

Note that my record of a student's past plagiarism does **not** reset with each semester.

### Grade Summary:

The available letters for course grades are as follows:

Grade	Percentage	Interpretation	Grade Points
A+	96-100	Excellent	4.00
A	92-96		4.00
A-	88-92		3.70
B+	83-88	Good	3.30
B	78-83		3.00
B-	73-78		2.70
C+	68-73	Satisfactory	2.30
C	64-68		2.00
C-	60-64		1.70
D+	55-60	Poor	1.30
D	50-55		1.0
F	<50	Failure	0.00
P		Pass	No Grade Points

Because of the nature of the Alpha 4.00 system, there can be no uniform University-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor's assessment of the level of each class, compared to similar classes taught previously. Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

### Ambrose University Important Policies & Procedures:

#### Registration

Registration is the process of selecting and enrolling in classes for upcoming semesters. Only students who are registered will be permitted to attend class and receive a grade for the course. You are responsible for ensuring that the courses you take are appropriate for your program, that they do not have any scheduling conflicts, that they have the necessary prerequisites and that they meet all degree requirements.

#### Withdrawal From A Course

Prior to the Add/Drop deadline: through the student registration system whereby course(s) will be removed with no academic or financial penalty. After the Add/Drop deadline and until the Withdrawal deadline: through submission of the 'Withdrawal from Course' form whereby course(s) will remain on the permanent

academic record/transcript with the symbol 'W'. (See [ambrose.edu/registrar/request-forms](http://ambrose.edu/registrar/request-forms).) Students who withdraw from more than 30 credits attempted at Ambrose University will be required to withdraw from their program. Students considering withdrawing from courses are encouraged to discuss with their Faculty Advisor and/or the Office of the Registrar questions relating to their withdrawal decision specifically relating to financial assistance, study permit requirements, prerequisites for subsequent courses, readmission, and/or graduation timeline. Students who do not formally withdraw from a course are still considered registered in the course, even if they are no longer attending classes. In this case, students will be assigned a grade based on coursework completed as per the course syllabus and are responsible to pay the tuition and fees assessed for the course. Under extenuating circumstances, students may request from the Office of the

Registrar a course(s) withdrawal after the Withdrawal deadline and until the last day of classes. Extenuating circumstances typically consider situations such as medical emergencies, compassionate grounds, or unforeseen conditions/situations beyond the students' control that arise after the start of the semester and are considered on a case-by-case basis. Supporting documentation from a physician or Registered Health Professional must accompany this request.

### **Coursework Extensions**

Should a request for a time extension on coursework exceed the end of the term, a *Coursework Extension Application* must be completed and submitted to the Office of the Registrar. The extension (if granted) will be recorded on the student record. Extensions are granted at the discretion of the instructor and registrar. If granted, time extensions do not excuse you from a final examination where one has been scheduled for the course. More conditions apply.

### **Exam Scheduling**

Students who find a conflict in their exam schedule must submit a *Revised Final Exam Time Application* to the Office of the Registrar by the deadline noted in the Academic Calendar. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; or 2) the scheduled final examination slot results in three consecutive examination periods. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

### **Communication**

Your Ambrose email account is the University's primary and official mode of communication with you. Information delivered to your Ambrose email is considered official notification. Ambrose University is not responsible for your failure to receive important information delivered to your Ambrose email.

### **Lecture Recording**

The recording of lectures or any other classroom academic activity, other than an audio recording as an accommodation, is prohibited except at the discretion of the instructor. Any use other than that agreed upon with the instructor constitutes academic misconduct and may result in suspension or expulsion. Permission to allow a lecture recording is not a transfer of any copyrights, so such recordings may be used only for individual or group study with other students enrolled in the same class and may not be reproduced, transferred, distributed or displayed in any public or commercial manner. Student must destroy recordings in any, and all formats at the end of the semester in which they are enrolled in the class. All students recording lectures, must sign the Permission Form to audio record lectures which is available through the Office of the Registrar.

### **Standards of Behaviour in the Classroom Setting**

Learning is an active and interactive process, a joint venture between student and instructor and between student and student. Some topics covered within a class may lead to strong reactions and opinions. It is important that Students understand that they are entitled to hold contradictory beliefs and that they should be encouraged to engage with these topics in a critical manner. Committing to this type of "active learning" significantly increases the learning experience for both teacher and student, and reflects the

Christian imperative to pursue truth, which lies at the heart of the Ambrose educational experience. However, active discussion of controversial topics will be undertaken with respect and empathy, which are the foundations of civil discourse in the Classroom Setting. Primary responsibility for managing the classroom rests with the instructor. The instructor may direct a student to leave the class if the student engages in any behaviour that disrupts the classroom setting. If necessary, Ambrose security will be contacted to escort the student from class.

### **Academic Integrity**

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to acknowledge to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university. Students are expected to be familiar with the policies in the current Academic Calendar that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.

### **Academic Policies**

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. The academic calendar can be found at <https://ambrose.edu/academics/academic-calendar>

### **Privacy**

Personal information (information about an individual that may be used to identify that individual) may be required as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at [privacy@ambrose.edu](mailto:privacy@ambrose.edu).

## **Academic Success and Supports**

### **Accessibility Services**

Academic accommodation is provided to Ambrose students with disabilities in accordance with the Alberta Human Rights Act and the Canadian Charter of Rights and Freedoms. Provision of academic accommodation does not lower the academic standards of the university nor remove the need for evaluation and the need to meet essential learning outcomes. Reasonable accommodations are tailored to the individual student, are flexible, and are determined by considering the barriers within the unique environment of a postsecondary institution. It can take time to organize academic accommodations and funding for disability-related services. Students with a disability who wish to have an academic accommodation are encouraged to contact Accessibility Services as

early as possible to ensure appropriate planning for any needs that may include accommodations. Staff can then meet with students to determine areas to facilitate success, and if accommodations are required, ensure those accommodations are put in place by working with faculty.

### **Ambrose Writing Services**

Ambrose Writing services provides academic support in the four foundational literacy skills—listening, speaking, reading, and writing. It also assists students with critical thinking and the research process. Throughout the academic year, students can meet with a writing tutor for personalized support, or they can attend a variety of workshops offered by Academic Success. These services are free to students enrolled at Ambrose University. Academic Success serves all students in all disciplines and at all levels, from history to biology and from theatre to theology. To learn more, please visit <https://ambrose.edu/sas/writing-services>

### **Ambrose Tutoring Services**

Ambrose Tutoring Services provides support in specific disciplinary knowledge, especially in high-demand areas such as chemistry, philosophy, math and statistics, and religious studies. These tutors also coach students in general study skills, including listening and note-taking. During the academic year, Ambrose Tutoring Services offers drop-in tutoring for courses with high demand; for other courses, students can book a one-to-one appointment with a tutor in their discipline. These services are free to students enrolled at Ambrose University. To learn more, please visit <https://ambrose.edu/tutoring>.

### **Mental Health Support**

All of us need a support system. We encourage students to build mental health supports and to reach out when help is needed.

#### On Campus:

- Counselling Services: [ambrose.edu/counselling](https://ambrose.edu/counselling)
- For immediate crisis support, there are staff on campus who are trained in Suicide Intervention Skills and can help you access mental health support. See <https://ambrose.edu/student-life/crisissupport> for a list of staff members.
- For additional wellness resources go to the Ambrose wellness page: <https://ambrose.edu/wellness>

#### Off Campus:

- Distress Centre - 403-266-4357
- Alberta Mental Health Helpline - 1-877-303-2642 (Toll free)
- Sheldon Chumir Health Care Centre - 403-955-6200
- Emergency - 911

### **Sexual Violence Support**

We are committed to supporting students who have experienced gender based sexual violence in the past or while at Ambrose. Many of the staff, faculty, and student leaders have received Sexual Violence Response to Disclosure training. We will support you and help you find the resources you need and you can access information about reporting. Information about the Sexual Violence policy and on and off campus supports can be found on our website— [ambrose.edu/sexual-violence-response-and-awareness](https://ambrose.edu/sexual-violence-response-and-awareness).

#### Off Campus:

- Alberta's Oneline for Sexual Violence - 1-866-403-8000 call or text
- Clinic: Sheldon Chumir Health Centre - 403-955-6200
- Calgary Communities Against Sexual Abuse - 403-237-5888
- Chat: [www.calgarycasa.com](http://www.calgarycasa.com)

**Note:** Students are strongly advised to retain this syllabus for their records.