

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: BIO 409		Number of Credits: 6 Course credit policy (105)															
Course Full Title: Directed Studies in Biology II Course Short Title: <i>(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)</i>																	
Faculty: Faculty of Science		Department (or program if no department): Biology															
Calendar Description: <p>Designed for students in a Biology major or minor, this course provides an opportunity to apply scientific principles in a creative hands-on directed studies research experience outside the usual course format. Students will develop their own projects in biology under the supervision of a faculty member with expertise in the field. BIO 409 is similar to BIO 408, but is designed to accommodate more ambitious projects.</p> <p>Note: This course is often taken over two semesters as BIO 409A and BIO 409B.</p>																	
Prerequisites (or NONE):		(B+ or better in three of BIO 201, BIO 202, BIO 210, or BIO 220), and instructor's permission.															
Corequisites (if applicable, or NONE):																	
Pre/corequisites (if applicable, or NONE):																	
Antirequisite Courses <i>(Cannot be taken for additional credit.)</i> Former course code/number: Cross-listed with: Dual-listed with: Equivalent course(s): <i>(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)</i>		Special Topics <i>(Double-click on boxes to select.)</i> This course is offered with different topics: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, topic will be recorded when offered.)</i>															
		Independent Study If offered as an Independent Study course, this course may be repeated for further credit: <i>(If yes, topic will be recorded.)</i> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit															
		Transfer Credit Transfer credit already exists: <i>(See bctransferguide.ca.)</i> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Submit outline for (re)articulation: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, fill in transfer credit form.)</i>															
Typical Structure of Instructional Hours <table border="1"> <tr><td>Lecture/seminar hours</td><td></td></tr> <tr><td>Tutorials/workshops</td><td></td></tr> <tr><td>Supervised laboratory hours</td><td></td></tr> <tr><td>Experiential (field experience, practicum, internship, etc.)</td><td></td></tr> <tr><td>Supervised online activities</td><td></td></tr> <tr><td>Other contact hours: Student-directed learning</td><td>90</td></tr> <tr><td>Total hours</td><td>90</td></tr> </table>		Lecture/seminar hours		Tutorials/workshops		Supervised laboratory hours		Experiential (field experience, practicum, internship, etc.)		Supervised online activities		Other contact hours: Student-directed learning	90	Total hours	90	Grading System <input checked="" type="checkbox"/> Letter Grades <input type="checkbox"/> Credit/No Credit	
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Labs to be scheduled independent of lecture hours: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes		Maximum enrolment (for information only): 6 Expected Frequency of Course Offerings: Every semester <i>(Every semester, Fall only, annually, etc.)</i>															
Department / Program Head or Director: Gregory Schmaltz		Date of meeting: October 1, 2021															
Faculty Council approval		Date of meeting: November 5, 2021															
Undergraduate Education Committee (UEC) approval		Date of meeting: January 28, 2022															

Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. Formulate a testable scientific hypothesis on a specific chosen biological topic.
2. Critique the scientific literature on the chosen topic.
3. Review technical literature to learn specific experimental techniques.
4. Analyze data gathered during controlled experimentation.
5. Communicate scientific findings in both written and oral forms.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (*Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.*)

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (*If more space is required, download Supplemental Texts and Resource Materials form.*)

Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.		<input type="checkbox"/>		
2.		<input type="checkbox"/>		

Required Additional Supplies and Materials (*Software, hardware, tools, specialized clothing, etc.*)

Typical Evaluation Methods and Weighting

Final written thesis:	35%	Proposal:	20%
Final research paper oral presentation:	15%	Final research paper poster presentation:	10%
Technical ability, organization and time management:	20%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

The student experience consists of several stages:

Selection of a suitable area

The student may already have a specific area of research in mind or a specific instructor with whom he or she would like to interact. In this case, the student and instructor will strike an agreement depending on:

- a) available equipment and space
- b) budget for consumables
- c) availability of appropriate faculty and staff

Otherwise, an instructor may suggest a project to a suitable student. In all cases, it will be the instructor's responsibility to ensure that the proposed project is appropriate for an upper level student to accomplish in the proposed time. It is also the responsibility of the instructor to ensure that equipment, funding, and space are available for the project and proper safety training is completed. In some cases, students may benefit from expert advice and input in addition to that of the supervising instructor (for example, industrial partners, etc.). However, it is always the responsibility of the instructor to ensure that the project conforms to UFV academic standards.

Design of research project

The student will survey the literature in a particular field under the guidance of the appropriate instructor.

The student will be assisted to build on the literature to formulate a testable hypothesis and design an appropriate experimental approach. The student will address questions such as: novelty of the approach, statistical analysis to be carried out, use of controls, use of replicates.

Carry out research

The instructor will aid the student in mastery of the techniques necessary to carry out the research. The student will be responsible for scheduling time for the various stages of the project, making sure equipment is available, reporting to the instructor and industrial sponsor where appropriate. Regular meetings of student and instructor are required for all projects.

Production of research paper

The student will be expected to produce a research paper that is clear and scholarly and written in the style of a major journal. The instructor will aid the student in producing a quality piece of science communication.

Industrial partners

If such an arrangement is possible, this will be set up through the UFV Research Office.