**COURSE SYLLABUS**

(Approved by the Department of Biology May 9 2023)

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| COURSE TITLE: | BIOL 480.3 Biology Research  |
| COURSE CODE: | *80026 (Fall) or 20021 (Winter) or ……… (Spring/Summer)* |   |  |
| CLASS SECTION:COURSE CREDITS: | 013.0 |
| TERM: DELIVERY:LAB/FIELD LOCATION:LAB/FIELD TIME: | *e.g., Fall 2024* In person / Research TBD based on consultation with the research supervisor6 hours/week; to be arranged with research supervisor |

# Course Description

The student will work on a laboratory or field project under the supervision of a faculty member. Before beginning, the student must obtain a supervisor and then submit an outline of the project for approval by the Head of the Department. At the end of the project, the student will submit to the Department a written report in thesis form. An oral presentation is required.

# Prerequisites

# Prerequisites: BIOL 301; and BIOL 380 or 15 credit units of BIOL courses at the 200-level of above, of which at least 6 credit units must be at the 300-level or above; and permission of the department.

# Note: Students with credit for BIOL 481 cannot take BIOL 480 for credit. Honours Agriculture Biology students may not take both this course and AGRC 494. Those in College Scholar Programs may not take this course in addition to another laboratory or field project designed under the Program.

# Course Overview

To provide you with an exciting opportunity and experience to conduct a research project in biology that takes place in the laboratory and/or field under the supervision of a faculty member and/or Adjunct Professor in Biology, and to communicate your research findings in an oral presentation and in the form of a final report (i.e., mini thesis).

# Course Registration

Students must first contact a faculty member and/or Adjunct Professor in Biology who are willing to supervise their research project. Students are required to submit a signed form to the Head of the Biology Department for approval prior to registration in the course. This document includes the title of the research project, a brief description of the project, a table of the assessment deadlines and metrics, and the signatures of both the student and supervisor.

# Land Acknowledgement

As we gather here today, we acknowledge that the Saskatoon campus of the University of Saskatchewan is on ***Treaty Six Territory*** and the ***Homeland of the Métis***. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. We would also like to recognize that some students may conduct research on other traditional Indigenous lands and we ask that you take a moment to make your own Land Acknowledgement to the peoples of those lands.

# Learning Outcomes

By the completion of this course, students will be expected to have:

 1. Selected a thesis topic of their choice and find a supervisor to guide that research.

 2. Developed a research question to investigate.

 3. Learnt how to find scientific peer-reviewed papers on their chosen topic, compared and summarized the strengths and weaknesses of these research papers (with an appropriate citation method) with respect to the student’s chosen research topic.

 4. Designed and implemented research with guidance from an expert supervisor.

 5. Learnt the protocols and safety protocols associated with conducting research in the lab and/or field. This may include taking on-line safety courses (e.g., lab safety, WHIMS and biosafety) at the U of S.

 6. Interacted with the supervisor in a timely manner and follow the guidance they provide.

 7. Independently conducted the research methods and measurements.

 8. Maintained a regularly updated research notebook (online or hard copy) that provides details of the experiments conducted and the results obtained.

 9. Developed or enhanced their technical skills with the use of lab/field equipment.

10. Analyzed data obtained using the appropriate statistical tests under the guidance of supervisor or another expert in the field.

11. Summarized the research findings and formulate conclusions and to present this in both written and oral form. This includes the generation of tables and figures to illustrate the experimental design and results obtained.

12. Enhanced their communication and critical thinking skills in writing (e.g., the project proposal and final min-thesis) and in oral presentation.

# Learning Charter

The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: <https://teaching.usask.ca/about/policies/learning-charter.php>.

# Required Resources

An important component of this course is finding and reading scientific literature. It is expected that students will base their literature on primary sources that are peer-reviewed and published in reputable journals. Students have access published literature via the University Library and website found at: https://library.usask.ca.

# Schedule and Attendance Expectations

Students are required to meet with the Supervisor on a weekly basis, and perform laboratory or field work, the results of which will be recorded by each student in a laboratory notebook. Research performance will be based on attentiveness to deadlines and a consistent work ethic over the course of the term. Students will organize when they conduct different aspects of their research project in consultation with the supervisor. Students are expected to work 6 hours per week on this course. Contact the supervisor in a timely manner if a course activity is missed to due to illness or other extenuating circumstance.

Safety in the laboratory is very important. Prior to performing any procedure, the student must be familiar with the reagents, equipment and possible hazards involved in the experiment. The University of Saskatchewan Work Alone Policy prohibits students to work alone in the laboratory. Therefore, BIOL 480 students must not work in the laboratory when no other member of the laboratory is present.

Grading Scheme and Timetable

Example If Fall term

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| --- | --- |
| **Assessment Metric:** | **Date(s) Grade is to be assigned:** |
| Literature Review & Research Proposal (10-15%) | ~ Oct 24  |
| Practical Research Performance (20-30%) | ~ Oct 17 (10-15%) & Dec 5 (10-15%) |
| Record of Research work (10%) | ~ Oct 17 (5%) & Dec 5 (5%) |
| Oral Presentation (10-15%) |  Dec 5 to 17  |
| PowerPoint slides from oral presentation (5-10%) |  Dec 5 to 17 |
| Final Report (25-35%) |  Dec 5 to 17 |
|  Total (100%) |  |

Note: The total subjective content for BIOL 480.3 (e.g., research performance and oral presentation) cannot exceed more than 40% of the course grade.

Example If Winter term

|  |  |
| --- | --- |
| **Assessment Metric:** | **Date(s) Grade is to be assigned:** |
| Literature Review & Research Proposal (10-15%) | ~ Feb 20 |
| Practical Research Performance (20-30%) | ~ Feb 13 (10-15%) & Apr 10 (10-15%) |
| Record of Research work (10%) | ~ Feb 13 (5%) & Apr 10 (5%) |
| Oral Presentation (10-20%).  |  Apr 10 to 22 |
| PowerPoint slides from oral presentation (5-10%) |  Apr 10 to 22 |
| Final Report (25-35%) |  Apr 10 to 22 |
|  Total (100%) |  |

Note: The total subjective content for BIOL 480.3 (e.g., research performance and oral presentation) cannot exceed more than 40% of the course grade.

Evaluation of Student Performance

**Literature Review and Research Proposal**

**Value**: 10-15% of final grade

**Description**: This represents initial work toward the final literature review to be included in the final report (mini thesis; see below) and is to be based on the literature research that has been conducted prior to the due date (in mid-term). It should include the objectives and hypotheses to be tested. Instructions for writing this review (e.g., length, formatting, etc.) and a grading rubric will be provided by the supervisor. Supervisors and students are encouraged to set a deadline for a draft submission of the literature review, to be worth no more than 5% of the 15% for this assignment to allow for supervisor feedback prior to final submission.

## Practical Research Performance

**Value**: 20-30% of final course grade

**Description**: Will include an assessment of the care and exactitude used to complete lab and/or field work in the course. Includes an assessment of adherence to deadlines, instructions and safety guidelines, plus overall initiative, attentiveness to detail and effort expended to obtain results. There will be an initial assessment and feedback provided about halfway through the course. A rubric will be provided by the supervisor.

## Record of Research work

**Value**: 10% of final grade

**Description**: Students are required to keep a legible, well-organized up-to-date and accurate record of their research work (e.g., as paper or electronic notebook). This is a very important and essential practice when conducting research. The date of an entry should be recorded and include details of the experimental design, protocols used, the results obtained and (if relevant) the results of the statistical analysis on the data. Images or other computer-generated results are to be uploaded with the research entry. Handwritten drawings or notes are to be photographed or scanned and uploaded. A low-resolution version of digital images should be added to the research notebook/record. There will be an initial assessment and feedback provided about halfway through the course. A rubric for this assessment will be provided by the supervisor. At the end of the course, the notebook or equivalent must be submitted to the supervisor; however, a student can make a copy of the research record for themselves.

**Oral Presentation**

**Value**: 10-15% of final grade; half of this value is allocated to marking the PowerPoint slides

**Description**: Each student will be required to give an oral PowerPoint presentation summarize their objectives, the major points of their literature review in relation to their research topic, and a detailed explanation and conclusions of the major findings of their research work. The length of the presentation will be decided in consultation with the supervisor but should not exceed 30 minutes (including audience questions). A rubric for assessing the oral presentation will be provided by the supervisor.

**PowerPoint slides from oral presentation**

**Value**: 5-10% of final grade

**Description**: Each student will be required to provide a copy of the PowerPoint slides from the oral presentation for assessment. A rubric for assessing the PowerPoint slides will be provided by the supervisor.

**Final Report**

**Value**: 25-35% of final grade

**Description**: This final report should include a comprehensive review/discussion of the primary research findings, particularly emphasizing recently published papers, the objectives of the research project, materials and methods, results and discussion. Instructions for writing this final report (e.g., length, formatting etc.) and a grading rubric will be provided by the supervisor. Supervisors and students are encouraged to set a deadline for a draft submission of the final report, to be worth no more than 5% of the 25-35% for this assignment to allow for supervisor feedback prior to final submission.

# University of Saskatchewan Grading System

Students in BIOL 480 are reminded that the University has established a grading system to be used in all of its courses. Information on literal descriptors for grading at the University of Saskatchewan (reproduced below) can be found at: <http://students.usask.ca/academics/grading/grading-system.php>

**Exceptional (90-100)** A superior performance with consistent evidence of

* a comprehensive, incisive grasp of the subject matter;
* an ability to make insightful critical evaluation of the material given;
* an exceptional capacity for original, creative and/or logical thinking;
* an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

**Excellent (80-90)** An excellent performance with strong evidence of

* a comprehensive grasp of the subject matter;
* an ability to make sound critical evaluation of the material given;
* a very good capacity for original, creative and/or logical thinking;
* an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

**Good (70-79)** A good performance with evidence of

* a substantial knowledge of the subject matter;
* a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
* some capacity for original, creative and/or logical thinking;
* a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.

**Satisfactory (60-69)** A generally satisfactory and intellectually adequate performance with evidence of

* an acceptable basic grasp of the subject material;
* a fair understanding of the relevant issues;
* a general familiarity with the relevant literature and techniques;
* an ability to develop solutions to moderately difficult problems related to the subject material;
* a moderate ability to examine the material in a critical and analytical manner.

**Minimal Pass (50-59)** A barely acceptable performance with evidence of

* a familiarity with the subject material;
* some evidence that analytical skills have been developed;
* some understanding of relevant issues;
* some familiarity with the relevant literature and techniques;
* attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner which are only partially successful.

**Failure <50** An unacceptable performance

# Copyright

Course materials are provided to you based on your registration in the class, and anything created by your supervisors is their intellectual property, unless materials are designated as open education resources. Copyright-protected material includes PowerPoint/PDF slides and other course notes. Additionally, other copyright-protected materials created by textbook publishers and authors may be provided to you based on license terms and educational exceptions in the Canadian Copyright Act (see [http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html)](http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html).

**Before you copy or distribute others’ copyright-protected materials, please ensure that your use of the materials is covered under the University’s Fair Dealing Copyright Guidelines available at**[**https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php**](https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php).For example, posting others’ copyright-protected materials on the open web is not covered under the University’s Fair Dealing Copyright Guidelines, and doing so requires permission from the copyright holder.

For more information about copyright, please visit <https://library.usask.ca/copyright/index.php> where there is information for students available at <https://library.usask.ca/copyright/students/rights.php>, or contact the University’s Copyright Coordinator at mailto:copyright.coordinator@usask.ca or 306-966-8817.

# Student Feedback

The Department of Biology or the supervisors may survey students regarding the course. This is generally done through an assessment near the end of term.

## Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity (<https://academic-integrity.usask.ca/>).  Academic misconduct is a serious matter and can result in grade penalties, suspension, and expulsion.

**Prepare for Integrity**

Students are expected to act with academic integrity.

* Students are required to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community (tutorial link: <https://libguides.usask.ca/AcademicIntegrityTutorial>) .
* Students can access campus resources that support development of study skills, time and stress management, and ethical writing practices important for maintaining academic integrity and avoiding academic misconduct.

**Responses to Misconduct**

Students are expected to be familiar with the academic misconduct regulations (<https://governance.usask.ca/student-conduct-appeals/academic-misconduct.php#About>).

* Definitions appear in Section II of the academic misconduct regulations.
* The academic misconduct regulations apply regardless of type of assessment or presence of supervision during assessment completion.
* Students are advised to ask for clarification as to the specific expectations and rules for assessments in all of their courses.
* Students are urged to avoid any behaviour that could result in suspicions of cheating, plagiarism, misrepresentation of facts.  Students should note that posting copyrighted course materials (e.g., notes, questions, assignments or exams) to third party websites or services or other forum or media without permission is an academic or non-academic misconduct offense.

Non-academic offenses are dealt with under the [Standard of Student Conduct in NonAcademic Matters and Regulations and Procedures for Resolution of Complaints and Appeals](https://governance.usask.ca/student-conduct-appeals/non-academic-misconduct.php).

# Access and Equity Services (AES)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals at any time. Those students who are registered with AES with mental health disabilities and who anticipate that they may have responses to certain aspects of the course should discuss this with their supervisors prior to course add / drop dates. In order to access AES programs and supports, students must follow AES policy and procedures. For more information or advice, visit <https://students.usask.ca/health/centres/access-equity-services.php>, or contact AES at 306-966-7273 or aes@usask.ca.

For information on AES services for please visit:

<https://students.usask.ca/health/centres/access-equity-services.php#Fall2021Information>

# Student Supports

## Academic Help for Students

The University Library offers a range of learning and academic support to assist USask undergrad and graduate students. For information on specific services, please see the Learning page on the Library web site <https://library.usask.ca/support/learning.php>.

Remote learning support information <https://students.usask.ca/remote-learning/index.php>

Class and study tips <https://students.usask.ca/remote-learning/class-and-study-tips.php>

Remote learning tutorial <https://libguides.usask.ca/remote_learning>

Study skills materials for online learning <https://libguides.usask.ca/studyskills>

A guide on netiquette, principles to guide respectful online learning interactions <https://teaching.usask.ca/remote-teaching/netiquette.php>

## Teaching, Learning and Student Experience

Teaching, Learning and Student Experience (TLSE) provides developmental and support services and programs to students and the university community. For more information, see the students’ web site <http://students.usask.ca>.

## Financial Support

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central (<https://students.usask.ca/student-central.php>).

## Aboriginal Students’ Centre

The Aboriginal Students’ Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, brining Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC’s Facebook page (<https://www.facebook.com/aboriginalstudentscentre/>) to learn more.

## International Student and Study Abroad Centre

The International Student and Study Abroad Centre (ISSAC) supports student success and facilitates international education experiences at USask and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students in their transition to the University of Saskatchewan and to life in Canada. ISSAC offers advising and support on matters that affect international students and their families and on matters related to studying abroad as University of Saskatchewan students. Please visit [students.usask.ca](http://students.usask.ca/) for more information.

## College Supports

Students in Arts & Science are encouraged to contact the Undergraduate Student Office and/or the Trish Monture Centre for Success with any questions on how to choose a major; understand program requirements; choose courses; develop strategies to improve grades; understand university policies and procedures; overcome personal barriers; initiate pre-career inquiries; and identify career planning resources. Contact information is available at: <https://artsandscience.usask.ca/undergraduate/advising/>

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**BIOLOGY 480.3 Course Proposal Form**

**Student’s name:**  **Signature:**

**Student number:** **NSID:**

**Proposed Supervisor:**   **Signature:**

**CRN#:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Term:** \_\_\_\_\_\_\_\_\_\_

**Proposed Project Title:**

**Project Outline:** Please provide a brief outline of the proposed research project. Include any relevant methodology and explain what the student will learn over the course of the project (attach additional pages if necessary).

**Evaluation:** Please indicate the value and when grades will be assigned. Will anyone other than the proposed supervisor be providing any assessment?

 Literature Review and Research Proposal: 10-15% *Add assessment date*
Research Performance: 20-30% *Add 2 assessment dates*

 Record of Research Work: 10% *Add 2 assessment dates*

 Oral Presentation: 10-15% *Add assessment date*

 PowerPoint Slides from oral presentation: 5-10% *Add assessment date*

 Final Report: 25-35% *Add assessment date*
 Total 100%

No more than 40% of the final grade to be comprised of the combined subjective tasks (e.g., research performance and oral presentation).

**A copy of the final report is to be provided to the Department.**

Approved: Date:
 (Department Head)