

## COURSE SYLLABUS

<b>COURSE TITLE:</b>	<b>BIOL 398 Research Experience in Biology</b>		
<b>COURSE CODE:</b>	To be determined	<b>TERM:</b>	Winter, 2017
<b>COURSE CREDITS:</b>	3 credit units	<b>DELIVERY:</b>	5P
<b>CLASSECTION:</b>	02	<b>START DATE:</b>	January 4, 2017
<b>CLASS LOCATION:</b>	Kirk Hall 117	<b>END DATE:</b>	April 7, 2017
<b>CLASSTIME:</b>	To be determined	<b>LAB LOCATION:</b>	Kirk Hall 46

### Course Description

The course is designed to provide students with an introduction to biological research. Students will study a research question with a faculty supervisor, through a combination of a research literature review and practical work. A written report and an oral presentation are required.

**Prerequisites:** Completion of 12 cu of senior BIOL courses and permission of the department. BIOL 301 is strongly recommended.

**Note:** Students are required to obtain a faculty supervisor prior to registration in this course. Students are encouraged to complete this course in their 3<sup>rd</sup> year. BIOL 480 or BIOL 481 are subsequently completed for credit, provided that the topic studied for BIOL 480 or BIOL 481 is substantially different than that studied in BIOL 398.

### Learning Outcomes

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

1. demonstrate an understanding of the research tools and methods in their selected area of study;
2. develop their ability to locate and comprehend the primary research literature in their area of study;
3. develop their ability to critically review the primary scientific literature;
4. relate the primary scientific literature to their practical work;
5. practice their scientific writing and oral presentation skills; and
6. keep accurate research records.

**Note:** 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: [http://www.usask.ca/university\\_secretary/LearningCharter.pdf](http://www.usask.ca/university_secretary/LearningCharter.pdf).

## Course Overview

The course consists of 5 hours of organized study per week for a total of 13 weeks. During this time, the student will be introduced to practical research in a discipline of Biology. This will involve laboratory analyses and computer-based analyses. The student(s) will participate in a project already ongoing in the supervisor's research program to learn practical aspects of research in marine benthic ecology. Four hours per week will be dedicated to this practical work. The student will be required to maintain a research notebook as a record of the work performed each week. In addition, the student will use University Library resources to conduct a review of the primary scientific literature relevant to the project under study. In addition to spending time on practical work and the literature review, the student is expected to meet with the faculty supervisor for one hour each week to specifically discuss progress towards meeting the course objectives and review their research notebook. The final meeting will consist of an oral presentation by the student. This presentation will summarize the literature review and relate findings from the practical work as appropriate. Other students or individuals from the Department of Biology will be invited to the final presentation as appropriate.

## Class Schedule

The exact schedule will depend on the nature of the practical work undertaken during the course. Students should plan to spend five hours on practical work and organized study in the faculty's supervisor's laboratory, plus one hour per week meeting with the faculty supervisor. During the first week of the course, the faculty supervisor will submit a brief description of the research project to the Head of the Department of Biology for approval.

For 2016-17, it is expected that the course will start the week of January 2, 2017 and finish the week of April 3, 2017, with no course meetings or practical work scheduled during the week February 20-24, 2017 (Winter Midterm Break).

## Instructor

Alec Aitken, Associate Member in the Department of Biology, will supervise the students in this course. Dr. Aitken has pursued research in marine benthic ecology since 1980 and his research experience covers Arctic estuary, fjord and continental shelf environments from the Canadian Beaufort Sea, to Axel Heiberg Island, to the coast of Labrador.

## Required Resources

Access to the University Library and Arts & Science Computer Account is needed. Students will need to purchase a new, hardcover, ruled, laboratory note-book for use during the course. Due to intellectual property issues, this note-book will be retained by the faculty member at the end of the course. Suitable note-books are available for purchase from the bookstore. Other resources will be provided by the faculty supervisor as appropriate for the practical experience.

## Grading Scheme

Practical Research Performance	25%
Research Notebook	25%
Research Literature Review	40%
Oral Presentation	10%
Total	100%

## Evaluation of Student Performance

### Midterm Practical Research Performance

**Value:** 15% of final course grade

**Date:** assessed two weeks prior to the last day to formally withdraw from the term

**Description:** this will be an assessment of the student's ability to learn and perform the practical aspects assigned by the research supervisor, including an assessment of the student's ability to plan and organize their work schedule. This midterm assessment should be discussed in the weekly meeting between the faculty supervisor and the student that occurs two weeks prior to the last day to formally withdraw from course. Any deficiencies in student performance, especially those that result in a failing grade for this component, should be specifically discussed and a remediation plan agreed upon by the faculty supervisor and student. The elements of this plan should be placed in the student's research notebook, and signed by the supervisor and the student.

### Final Practical Research Performance

**Value:** 10% of final course grade

**Date:** assessed prior to the end of the term

**Description:** this assessment will be based on the student's performance on practical aspects performed subsequent to the Midterm Practical Assessment, and should take into account any special remediation plan agreed upon during the Midterm Assessment.

### Research Notebook

**Value:** 25% of final course grade

**Due Date:** last week of the term (i.e., prior to the start of the final exam period).

**Description:** the research notebook will be provided to the faculty supervisor during the last weekly meeting. The faculty supervisor will assess the quality (i.e. clarity and comprehensiveness) of the information included by the student in the notebook.

### **Literature Research Review**

**Value:** 40% of final course grade

**Due Date:** last week of the term (i.e., prior to the start of the final exam period).

**Description:** the student will research the primary peer-reviewed literature relevant to the project under study and prepare a substantive written review of this literature. The exact format of this written review will depend to some extent on the discipline, but it is anticipated that the student will incorporate all relevant published literature into the review paper, and specifically highlight how the literature underpins the practical work performed during this course. The written review will be provided to the faculty supervisor no later than the last weekly meeting.

### **Oral Presentation**

**Value:** 10% of final grade

**Date:** scheduled during the last week of the term

**Format:** 30 minute presentation with appropriate visual aids.

**Description:** the student will present a short seminar on the topic of their literature research paper. This presentation will be advertised within the Department of Biology and the student can expect an audience that includes a variety of individuals from the Department.

## **Providing Feedback to Students**

It is important that the student be provided with adequate feedback about their performance as the course progresses, and that an opportunity is provided for them to rectify serious deficiencies. The weekly meetings between the student and faculty supervisor are an important aspect of this assessment and feedback. These meetings should also be used to discuss the student's progress in the literature search, and as an opportunity to ensure consistent progress is being made towards an appropriate level of understanding of the scientific literature. It is intended that this feedback occur through verbal discussions, with the expectation that students will learn and grow through this feedback. Serious concerns about student performance that are raised as part of the Midterm Practical Research Performance assessment should be written in the research notebook as described above.

## **Late Assignments/Missed Deadlines/Attendance**

### **Expectations**

Students are expected to plan and execute their practical work schedule (keeping in mind general lab expectations, safety and other constraints) and to perform these as they have agreed to do so. Missing this work or deadlines will be negatively reflected in their Practical Research Performance grades. Faculty will accept and grade the literature review or research note-book when these are submitted after the deadline (i.e., after the last weekly meeting of the student and faculty supervisor). However, failure to submit these course requirements will incur a penalty equivalent to a 5% deduction from the assigned grade for every day that the work is overdue. Work that is overdue by more than seven days will be assigned a grade of o.

A student who misses the Oral Presentation will be assigned a grade of o for that component of the course.

The course instructor is sensitive to situations beyond a student's control that affect their ability to complete assigned work in a timely fashion. Circumstances arise that may require your absence from meetings and practical work. Please inform your course instructor of planned absences (i.e., does not include vacations) in advance so that alternate arrangements can be made to complete the assigned work. In the case of illness or other personal situations, please inform the course instructor of your circumstances within 72 hours of your first absence from the course. Permission to defer the submission of assigned work must be obtained from the course instructor. Requests for extensions exceeding one week beyond the scheduled date for submission will require a written explanation: all other requests will be dealt with informally by the course instructor.

### **Criteria That Must Be Met to Pass**

Students must provide their faculty supervisor with their research notebook at the end of the course. Failure to do so will result in a final course grade of 49%, or lower depending on their performance in other aspects of the course, along with a grade comment of INF (Incomplete Fail).

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

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct - ([http://www.usask.ca/university\\_secretary/honesty/StudentAcademicMisconduct.pdf](http://www.usask.ca/university_secretary/honesty/StudentAcademicMisconduct.pdf)) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals - ([http://www.usask.ca/university\\_secretary/honesty/StudentNon-AcademicMisconduct2012.pdf](http://www.usask.ca/university_secretary/honesty/StudentNon-AcademicMisconduct2012.pdf)).

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at: [http://www.usask.ca/university\\_secretary/pdf/dishonesty\\_info\\_sheet.pdf](http://www.usask.ca/university_secretary/pdf/dishonesty_info_sheet.pdf).

## Grading System

A percentage system for reporting final grades was implemented by the University of Saskatchewan in September, 1986. The university-wide relationship between literal descriptors and percentage scores for undergraduate courses is as follows:

<p><b>90-100 Exceptional</b></p>	<p>A superior performance with consistent strong evidence of</p> <ul style="list-style-type: none"> <li>• a comprehensive, incisive grasp of the subject matter;</li> <li>• an ability to make insightful critical evaluation of the material given;</li> <li>• an exceptional capacity for original, creative and/or logical thinking;</li> <li>• an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.</li> </ul>
<p><b>80-90 Excellent</b></p>	<p>An excellent performance with strong evidence of</p> <ul style="list-style-type: none"> <li>• a comprehensive grasp of the subject matter;</li> <li>• an ability to make sound critical evaluation of the material given;</li> <li>• a very good capacity for original, creative and/or logical thinking;</li> <li>• an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.</li> </ul>
<p><b>70-79 Good</b></p>	<p>A good performance with evidence of</p> <ul style="list-style-type: none"> <li>• a substantial knowledge of the subject matter;</li> <li>• a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;</li> <li>• some capacity for original, creative and/or logical thinking;</li> <li>• a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.</li> </ul>
<p><b>60-69 Satisfactory</b></p>	<p>A generally satisfactory and intellectually adequate performance with evidence of</p> <ul style="list-style-type: none"> <li>• an acceptable basic grasp of the subject material;</li> <li>• a fair understanding of the relevant issues;</li> <li>• a general familiarity with the relevant literature and techniques;</li> <li>• an ability to develop solutions to moderately difficult problems related to the subject material;</li> <li>• a moderate ability to examine the material in a critical and analytical manner.</li> </ul>
<p><b>50-59 Minimal Pass</b></p>	<p>A barely acceptable performance with evidence of</p> <ul style="list-style-type: none"> <li>• a familiarity with the subject material;</li> <li>• some evidence that analytical skills have been developed;</li> <li>• some understanding of relevant issues;</li> <li>• some familiarity with the relevant literature and techniques;</li> <li>• 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.</li> </ul>
<p><b>&lt;50 Failure</b></p>	<p>An unacceptable performance</p>

## **Examinations with Disability Services for Students (DSS)**

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <http://www.students.usask.ca/disability/> or contact DSS at 966-7273 or [dss@usask.ca](mailto:dss@usask.ca).

Students who are in need of accommodation for certain aspects of this course must present the appropriate letter from DSS to their faculty supervisor, and engage in a discussion with the faculty supervisor as to the nature of the accommodation needed. Where appropriate, the faculty supervisor may seek advice about the accommodation from the experts at DSS.