

Undergraduate Research Project Courses
Faculty of Science, McGill University
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1 Introduction

The Faculty of Science is currently working on several initiatives to increase undergraduate research opportunities. This document proposes one such initiative related to academic programs, namely new undergraduate research project courses, to be offered by different units in the Faculty.

2 Undergraduate Research Project - XXXX 396

Many undergraduate programs in the Faculty already have a project or independent research course component. Often these courses are:

- part of an Honours program (although some are also available to students in a Majors program),
- part of a program (i.e. not electives),
- taken in the last year of study, and
- aimed towards students studying within the unit offering the course.

The purpose of the new proposed *Undergraduate Research Project* courses is to broaden the scope of research courses, to make these courses available to more students, and to make the undergraduate research component more interdisciplinary. More specifically:

- these courses would be available to students in any program offered by the Faculty of Science,
- would be elective courses,
- could be taken by students after one term of undergraduate study, not just during their final year, and
- some projects would be structured such that they can be taken by students whose major is outside the unit offering the course (provided the student has the required prerequisites for the project).

We have selected the title *Undergraduate Research Course* so as to emphasize that this is part of our overall theme of promoting undergraduate research and to have a title which is distinct from existing project courses.

Given the very broad nature of the Faculty of Science, we can expect research projects to vary quite a bit from unit to unit. For example, some projects may have a substantial laboratory component, while other projects may have a more theoretical focus. However, some key guidelines are:

- a research project should contain a significant research component that requires substantial independent work by the student,
- the research project must require a final report, written in a style appropriate for the discipline,
- the level and time commitment of the project must be appropriate for a 3-credit course (9 hours per week for 13 weeks) offered at the 300-level, and
- some projects should be accessible to students outside of the unit offering the course.

2.1 Course Details

Course Number: For each unit offering such a course, the course number will be the four letter unit abbreviation followed by 396. Thus, we will have a collection of courses of the form ATOC 396, BIOL 396, CHEM 396, COMP 396 and so on.

Course Title: Undergraduate Research Project

Course Status:

- Elective. The courses will not be part of any program, but will be taken as electives.
- These courses cannot be taken S/U. The rationale for this restriction is that instructors will invest significant effort into proposing and advising these projects would like a serious commitment from students.
- This course will be listed as a “slot” course, which means that a student may take the same course more than once for credit. However, the student must have a different advisor and project each time they take the course.

Course Credit: 3 credits. (*Note that this means that the project should be equivalent to 9 hours of work per week, for 13 weeks.*)

Terms Offered: Ideally a unit would offer this course in all three terms: fall, winter and summer. This would provide the most research opportunities for the students.

Prerequisites and Permissions:

- The student should have completed at least one full term of undergraduate students and have a CGPA of at least 3.0, or permission of the instructor to waive these requirements.
- The student must have the permission of the instructor to take on a particular project. Instructors will be asked to list project-specific prerequisites with the project description. It is the responsibility of the instructor to ensure that the student they select for the project has a strong enough background for the project.

- Instructors cannot supervise the same student for two 396 courses.
- Permission of the unit must be given by the unit head or his/her delegate. The head of the unit must ensure that the proposed project involving the student has real research content and is at an appropriate level. The head/delegate must also ensure that an appropriate load is given to faculty members.

2.2 Organization

The organization of the courses would proceed as follows:

- Individual units will decide if they will offer a 396 course or not, and in which terms. If a unit wants to offer the 396 course, they will prepare a standard new course proposal, a template for that proposal will be provided by the Faculty.
- Instructors will be asked to provide project descriptions, along with any necessary information about prerequisites. The Office for Undergraduate Research in Science (OURS) will provide appropriate forms and publish these descriptions on the OURS web site <http://www.mcgill.ca/science/ours/>. Ideally, a project should be posted by the middle of the term before the project would take place. Subsequent aspects of approval and registration for the course are handled by the unit offering the course.
- Students interested in a potential project will communicate with the instructor proposing the project.
- When an instructor and student agree upon a project, they should complete a short proposal form which includes the course number, student name and ID, faculty member name, intended term, project description and marking scheme. The marking scheme must include a component for a written report which is at least 50% of the final grade. The OURS office will provide the appropriate forms which will be generated using the project information and the student information.
- The proposal form is approved (or not) by the unit head or his/her delegate.
- Students with approved forms are given a code from the unit so that they can register for the course on Minerva. This process should be completed before the beginning of the term in which the project will be done.
- Students are advised throughout the term by the instructor and any appropriate researchers. Some units may want to give some introductory lectures, meetings or lab safety instruction to groups of students enrolled in the course.
- The student must present his/her final report to the instructor in charge of the project before the last day of classes.
- The instructor in charge of the project has the responsibility of assigning a letter grade to the project, and to provide feedback about the report to the student.
- Each unit offering a 396 course must have a person responsible for submitting the grades for the course, for each term the course is offered.
- Selected final reports may be submitted to OURS for possible posting on the OURS website. OURS will provide an appropriate form documenting permission to post the report from both the student and instructor.

2.3 Resources

Some projects will require extra resources such as laboratory supplies, specialized software and lab space. Units may apply to the Dean of Science for extra resources. For 2006-2007 the amount will be \$300.00 per project. As many projects as possible will be funded from the budget available.

2.4 Proposed Calendar Entry:

XXXX 396 Undergraduate Research Project. (3)

(Prerequisites: Completion of at least one term of undergraduate studies and a CGPA of at least 3.0, or permission of instructor to waive these requirements. A project proposal form must be completed by the student and instructor and approved by the unit head or his/her delegate before the start of the term.)

(Restrictions: Departmental approval required. This project cannot be taken under the S/U option. Student cannot be supervised by the same instructor for two 396 Science courses. Open to students in programs offered by the Faculty of Science only.)

(Note that enrolment may be limited. Students are advised to start the application process well before the start of the term and to plan for an alternative course in the case that no suitable project is available. Individual projects will be suggested each term which may have project-specific prerequisites. Some projects may be accessible to students in other disciplines. See <http://www.mcgill.ca/science/ours/> for more information about available projects and application forms and procedures.)

Independent research project with a final written report.