

Earth Sciences 4490E – Senior Undergraduate Thesis 2018-2019

Course Syllabus

(last updated 23/08/2018)

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Purpose: This course is intended to offer you the opportunity to conduct independent research under the guidance of a supervisor. It will also train you to present scientific results during oral presentations and in a written thesis. Your supervisor(s) will also have the opportunity to evaluate your capability to conduct individual, independent research as you develop your Senior Thesis.

Prerequisites: Registration in year four of a Specialization, Honors Specialization, or Professional Program offered by the Department of Earth Sciences, or permission of the Department. (Please note that, “*unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.*”)

Responsibilities: The student will conduct *independent* research under the guidance of a supervisor, attend most class meetings and all departmental colloquia, and meet all deadlines (please see Course Outline and timetable for more detail). The supervisor will provide guidance similar to what is accorded to an incoming MSc student.

Meetings: The scheduled class meeting times for ES 4490E are:

- Fall term: Tuesdays 1:30-2:30 pm in BGS 1084
- Winter term: Mondays 1:30-2:30 pm in BGS 1084

The meetings, although scheduled weekly, will take place only as circumstances require. All ES 4490E students will be expected to be at these meetings, as they are an important means of communication among students and faculty.

ES 4490E Grading Scheme: (for more detail, please see the Course Outline below)

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|--------------------------------------|---|
| • Thesis (50%) | Marked by two independent reviewers and supervisor(s) |
| • Research Performance (30%) | Based on reports and interviews from your supervisor(s) |
| • Oral presentation (15%) | First presentation 5%, final presentation 10% |
| • Academic participation (5%) | Based on attendance & participation in Colloquia |

Academic participation: As part of the learning process I expect all students to participate actively in meetings and Departmental Colloquia. **Remember that 5% of your grade is assigned to attendance and participation.** Here are some guidelines to keep in mind:

- You arrive at course meetings and Colloquia on time and are not absent without reason. Please arrange for absences beforehand if you anticipate not being able to participate.
- You display body language that communicates interest in what others are saying.

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- You ask questions that are thoughtful, penetrating or help clarify concepts.
- You actively encourage others to express their ideas or questions.
- You make outstanding, original, and informative comments.

Department Colloquia

- Friday 1:30-2:30 room BGS 0153 (Fall and Winter) is the Department Colloquia

Late penalties: Reports and theses that are handed in after the due date will suffer a 5% penalty for the first 3 days and 10% penalty per day after that. Please contact the instructor immediately if you can't meet a deadline.

Illness: If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Accessibility: Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Statement on Academic Offences: Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Plagiarism: The following official statement on Plagiarism is standard for all Western courses and is especially pertinent here! Note that the students submitting written material for this course may be subject to analysis using a similarity score software package such as Turnitin.

“Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).”

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The Course Outline and Deadlines

Under supervision of a faculty member, you will choose a research project, carry out research, submit progress reports and write a thesis describing the research findings. During the two terms there will be two progress reports and two presentations leading to one final thesis.

Choosing a thesis topic: **Tuesday, September 18, 2018**

Some of you may have a thesis topic lined up already, but many of you will still be trying to define a topic, even if you have already chosen your Supervisor(s). Check through the possible thesis topics offered by Professors and by all means also visit Professors in person to talk about possible projects.

By the deadline you will need to provide the coordinator a one-page document with your **Supervisor, Thesis title, and Project Description** (less than 100 words). Make sure that your supervisor has signed it! Please also email the instructor your thesis topic title and supervisor(s).

REPORT 1: Due to your supervisor(s) on **Tuesday, November 20, 2018**. This report includes:

- Thesis Outline: One-page overview of the intended study, including rationale and methods being used.
- Introduction: State the problem (that is, your “thesis”) in general terms. Provide here a detailed section on “Previous studies,” leading to a discussion of the anticipated significance of your work in the context of these previous studies.
- Methods: Describe in detail the methodology (theory, experimental, numerical, and field techniques) used for your work.
- References: Back up your literature review with a comprehensive bibliography that provides appropriate general and specific references for your thesis topic.

You will meet for an official interview with your supervisor(s) at this time to evaluate your progress thus far. Bring your lab and/or field notes along with any other relevant documents for your thesis discussion.

Thesis Proposal Presentation: **Monday January 14, 2019, 1:30 pm**

You will give a 5-minute presentation on your thesis proposal and preliminary findings to the assembled class and faculty. A maximum of 5 slides will be used for each presentation. Preparing well for this presentation will help focus your thesis!

REPORT 2: Due to your supervisor(s) on **Monday, February 11, 2019**. This report should be approaching a rough draft of the entire thesis. It should include:

- An improved Introduction to provide a more accurate articulation of the problem, previous work and significance of your work in this context.
- Methods: Describe in detail the methodology (theory, experimental, numerical, and field techniques) used for your work.
- Preliminary Results: Present your preliminary results.
- Discussion: Discuss any interpretations arising from your methods and results thus far, leading to preliminary conclusions.

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- In a separate one-page document, outline a reasonable plan for completing your project!

You will meet for another official interview with your supervisor(s) at this time to evaluate your thesis at this later stage. This is an excellent opportunity to define the work that remains, and how to best achieve it! As before, bring your lab and/or field notes along with any other relevant documents for your thesis discussion.

Submission of Thesis and its data for Review: Friday March 15, 2019, 12:00 noon

- Submit a **complete copy** of your thesis incorporating all supervisor corrections and ready for examination **to the coordinator**. *With this submission, there must be included a separate statement from the supervisor(s) that all relevant field or laboratory data have been given to the supervisor(s).* The thesis will be examined by two independent reviewers, who will be asked to provide comments.
- Please submit to the instructor a one-page publication-ready **Abstract** (a “lastname.pdf” or doc file) to be included in the *Program and Abstracts* for the Presentation Day event.

Thesis Final Presentation: Friday March 22, 2019, 12:30-5:00

Faculty members, Professional Geologists, other researchers and your peers will be in attendance. Faculty members including supervisors will participate in evaluating the presentations. Details on the program will be available closer to the date.

Submission of Final, Revised Thesis Copy: Monday April 15, 2019, 12:00 noon

The reviewed theses with comments will be returned to students on April 9. You must now incorporate all the reviewer comments and submit one final **complete copy** to the Coordinator as well as a **copy for your supervisor(s)**. This final submission of your revised thesis marks the completion of ES 4490E. Note it is mandatory that every student submits a **final complete thesis by April 15, 2019** as a partial fulfillment of this course. ***Failing to do so will result in a failing mark of 40% for the course!***

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ES4490E Course Evaluation Details

Thesis Evaluation Meeting: Friday April 5th, 2019, 10:30 am room 1027 B&G

All Faculty Members evaluating the theses and the thesis supervisors are requested to attend this meeting. Please arrange your schedules to keep this time slot free.

The thesis submitted on March 15, 2019 will be evaluated by at least two examiners, as well as by the supervisor(s), leading to a final thesis mark. Prior to the meeting, Faculty Members not supervising any theses will be asked, on average, to evaluate 2 theses. A reviewer shall provide a formal review report, as if for a formal scientific journal manuscript and provide their mark. The reviewer's report and comments will be passed to the student as a guide for the student to revise the thesis. In addition, the supervisor is going to provide a mark for the thesis.

At the meeting, the quality of each submitted thesis will be discussed based on reviewer's report and supervisor's evaluation. An attempt is made to rank the theses to ensure uniformity in the evaluation. A final mark is assigned for every written thesis. The instructor will arbitrate conflicts and, if necessary, will have final say on marks.

ES 4490E Grading Scheme:

- **Thesis (50%)** Marked by two independent reviews
- **Research Performance (30%)** Based on reports and interviews from your supervisor(s)
- **Oral presentation (15%)** First presentation 5%, final presentation 10%
- **Academic participation (5%)** Based on attendance & *participation in Colloquia*

Details of the evaluations are as follows:

Thesis (50% of total course mark)

The thesis submitted in March will be evaluated by at least two examiners and the supervisor(s) based on this rubric:

Abstract (5% of thesis mark): A one-page (less than 500 words) summary of the work, independent of the thesis. The abstract informs the reader of the problem you tackled, the method you used, the findings you made, and the meaning of your work. The abstract should be written for the general scientific audience and should contain no references.

Introduction (15% of thesis mark): This is a fundamentally important section. It informs the reader as to: (1) the topic on which you are reporting; (2) previous studies; (3) the goal of the present study and its relevance to (and distinction from) previous studies. The Introduction should serve as the starting point for any reader who wants to know more about the context of what you are studying. Use of simple context figures and extensive use of relevant references is encouraged! Previous studies (e.g., Geological Setting) may be presented under a sub-heading in the introduction or under an entirely separate chapter heading.

Methods [Theory, Experimental, numerical, and Techniques] (20% of thesis mark): Complete development of theory, experimental techniques, numerical methods, and field study work. Use diagrams, maps or tables where appropriate, definitions, expressions etc. relevant to the research should be included. The Methods section is where you demonstrate your grasp of the tools that you used to conduct your

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research. You may defer items such as a glossary of terms or instrument calibration, etc. to an Appendix following the main text of your thesis.

Results (20% of thesis mark): Presentation of your findings, critically including the use of figures and summary tables where applicable, as well as a demonstrated understanding of sources of error, this being an evaluation of the quality and quantity of your results. This section does *not* include scientific interpretations or conclusions arising from your results, just a clear and full presentation of the results! An Appendix reporting more detailed results (e.g., a full table of analyses, additional figures) is encouraged and would be considered as part of this mark.

Discussion and Conclusions (15% of thesis mark): A complete interpretation of your results through a clear, logical discussion of their immediate and long-term implications for the science. There must be a clear statement of the accomplishments of your study, and a clear statement of how results might be ambiguous or incomplete. In this section you can also identify areas for improvement or future work.

References (10% of thesis mark): It is vitally important that you demonstrate an ability to conduct a comprehensive, scholarly, **independent**, literature search. This is an acquired skill that is required in many vocations. Web searches are by no means comprehensive! A scholarly search includes perusal of reference lists of recent or older significant articles for important contributions missed by web searches. You will benefit from a 'deeper' literature search.

Overall presentation (15% of thesis mark): Format (sub-sections, figures and tables, references), presentation quality (grammar, lack of typographical errors), proper content in Abstract and Front Matter (list of Figures; list of Tables).

Research Performance (30% of total mark)

The two reports and interviews with supervisor(s) along the Thesis Proposal presentation will constitute the mark.

Final Oral Presentation (15% of total mark)

This will be based on the Final Presentation (15%):

- quality of the presentation (content, organization and clarity of presentation)
- response to questions, discussion

Academic Participation (5% of total mark)

This mark will be based on attendance *and participation in* 4490E classes and departmental colloquia talks given throughout the fall and spring academic terms. Attendance in the Colloquium is mandatory. The Colloquia are scheduled for Fridays from 1:30 – 2:30 pm in B&GS 0153. Please check the Earth Sciences website <http://www.uwo.ca/earth/> for details.