

Course Outline

Earth Sciences 4490E: SENIOR THESIS

Environmental Sciences 4999E: HON RESEARCH PROJECT

1. Course Information

Course Information

Lectures: Wednesday 9.30 AM-10.30 AM at MC-17 (Middlesex College)

Plus, independent research with your supervisor and attendance at regular colloquium of the Earth Sciences Department.

List of Prerequisites

ES 4490E: Registration in Year 4 of a Specialization or Honours Specialization offered by the Department of Earth Sciences, or permission of the Department. Ideally, you have arranged a project with a supervisor before completing registration.

ENVIRSCI 4999E: Year 4 registration in the Honours Specialization in the Environmental Science module. Ideally, you have arranged a project with a supervisor before completing registration. A list of available projects for the upcoming 2025-2026 academic year is posted on the course website.

Unless you have either the requisites for this course or written special permission from your Department/Program Advisors and Science Academic Advisors 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.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Alina Shchepetkina	ashchep@uwo.ca	BGSB-1078	519-6612111 (ext. 84432)	By appointment

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

ES 4490E: A presentation of research on a chosen problem. Original data must be generated from field or laboratory studies and analyzed using appropriate methodologies. The results must be integrated into the existing literature on the topic. Independence in the conducting and reporting of research must be demonstrated.

ENVIROSCI 4999E: Explore the investigative nature of science by performing an experimental or theoretical research project under the supervision of a faculty member while making connections between two or more scientific disciplines. Key aspects of the project may include experimental design, instrumentation, data collection and analysis, and the communication of results.

Antirequisite(s): Biology 4970F/G, Biology 4998E, Biology 4999E, Chemistry 4491E, Earth Sciences 4490E, Environmental Science 4970F/G, Environmental Science 4999E, Computer Science 4490Z, Physics 4999E.

Learning outcomes:

After successfully completing this course, students will be able to:

1. Plan and develop safe and ethical laboratory and field procedures to independently collect and record scientific data.
2. Organize and analyze data, assess and control data quality, and report and interpret basic quantitative findings in textual, tabular, and graphical forms to reach a scientific conclusion.
3. Communicate analyses effectively with interdisciplinary audiences through written reports and oral presentations that adhere to the norms and standards of their discipline.
4. Independently complete a research project with direction from an expert.

Classes begin: September 8, 2025; January 5, 2026

Fall Reading Week: November 3-9, 2025

Winter Reading Week: February 16-20, 2026

Classes end: December 9, 2025; April 10, 2026

Lectures will mostly occur during the Fall term with a few meetings in the Winter term when you will predominantly work on your thesis. Before the first lecture on September 10, read through the syllabus so that you can ask questions during the lecture and make sure to secure a supervisor and a topic of research. Any additional lectures, if needed, will be announced via OWL.

Lecture topics (in white) and other deadlines (in blue) include:

Date	Topic	Comments
Sept 10	Introduction and course requirements	Submit “ Project Declaration ” form on OWL by next lecture: include Supervisor, Project title, Description (less than 100 words).
Sept 17	Writing a proposal/introduction	Submit “ Reader Selection Form ” on OWL by next lecture. If you do not have readers yet (2 needed), speak to your supervisor for suggestions: you will need them in place to mark the thesis submission
Sept 24	Thesis structure. Abstracts and Formatting	Health & Safety Forms to be completed before next lecture. Send to mmackawa@uwo.ca or hand in to Miyako Maekawa (BGS 1034) and submit on OWL.
Oct 1	Responsible use of Gen AI	Delivered by Stephen Spong

Oct 8	Library training #1	Meet at Taylor Library Instruction room and bring your laptop to the training session. Topics covered: use of Zotero/Mendeley and databases (Web of Science, Scopus, GeoRef, and Google Scholar). Delivered by Dan Sich
Oct 15	Library training #2	Meet at Taylor Library Instruction room. Topics covered: Search tips and approaches to finding knowledge sources not found in commercial databases (i.e., grey literature); appropriate use of AI (i.e. as an inquiry tool); OA publishing and predatory journals. Delivered by Dan Sich
Oct 22	Writing a Methods section	
Oct 29	Results versus Discussion	
Nov 7	Written Proposal Submission by 4 PM	To supervisor and on OWL. Grade penalty for late submission is 1% per day after 4 PM on Nov 7. Supervisor to submit “ Thesis Proposal Rubric ” to Instructor by Nov 21, 4 PM.
Nov 12	Lightning talk # 1: tell us about your project	By Nov 10, upload your slide for the Lightning Talk #1 (pdf) on OWL. Missed talk (without accommodation) 2% deduction on grade.
Nov 19	Visualization tools in research	Topics covered: Matlab; 3D visualization in Leapfrog Geo; ArcGIS mapping and geostatistical interpolations. Delivered by Sanaz Darzipour and Mohammad Salsabili
Nov 26	Best practices for presentations	
Dec 3	Lightning talk # 2: update of your research: what works what doesn't (2 min, 1 slide, no animations)	By Dec 1, upload your slide for the Lightning Talk #2 (pdf) on OWL. Missed talk (without accommodation) 2% deduction on grade.
Jan 16	Presentation to department #1	By Jan 14, upload your presentations on OWL (pdf). Missed presentation (without accommodation) 10% deduction on grade.
Feb 4	Building healthy relationships with supervisors and peers	TBD. Delivered by CTL/ Student Experience center.
Feb 11	Research ethics	Delivered by Stephen Spong
Feb 27	Thesis Draft Submission (near complete draft of thesis with all sections included) by 4 PM	To supervisor and on OWL. Grade penalty for late submission is 1% per day after 4 PM on Feb 27. Supervisor to submit “ Thesis Draft Rubric ” to Instructor by March 13, 4 PM.
March 4	Writing successful grants and company reports	Delivered by Dr. Patricia Corcoran
April 2	Final Thesis Submission by 4 PM	Upload your final thesis on OWL (include a statement from the supervisor(s) that thesis-related lab/field data have been received). Grade penalty for late submission is 1% per day after 4 PM on April 2.

April 10	Presentation to department #2	By April 8, upload your presentations on OWL (pdf). Missed presentation (without accommodation) 10% deduction on grade.
April 17	Readers submit thesis evaluations; thesis back to students	Readers use Rubric for a BSc Thesis, send grades and comments to Instructor only. Instructor will distribute evaluations to students.
April 24	Introduce revisions and re-submit final version of thesis by 4 PM.	To supervisor and upload on OWL. Supervisor grades thesis and revisions and submits a Thesis Approval Form .

4. Course Materials

This course does not have a textbook. Independent research will require extensive reading of scientific literature that is sought out by the student and in some cases recommended by their supervisor.

All course material will be posted to OWL: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

	4490E and 4999E	Value	Evaluator	Due date
1	Report #1 (Written Proposal)	10%	Supervisor	Nov 7 (Supervisor returns by Nov 21)
	Interview/meeting with supervisor			
2	Presentation to department	10%	Department	Jan 16
3	Report #2 (thesis draft)	10%	Supervisor	Feb 27 (Supervisor returns by March 13)
	Interview/meeting with supervisor			
4	Colloquium attendance and participation (ask Qs)	10%	Instructor	Fall and Winter terms
5	Final Thesis*	40%	Readers (2)	April 2 (Readers return by Apr 17)
6	Final presentation to department	10%	Department	April 10
7	Experimental work and revisions*	10%	Supervisor	April 24

*The thesis and experimental work are essential components of the course. You must pass both to receive a passing grade. If you fail one or both of these but have an average above 50%, you will be assigned a grade of 45%.

Time investment

You will get out of this course what you put in. In addition to the mandatory classes and thesis presentations, you are expected to attend regular lab meetings, department seminars, and one-on-one meetings with your supervisors as required by your supervisor. On top of this, anticipate investing at least 15 h/week in the various aspects of your research, ranging from reading to experimental work, to writing. We will discuss time management strategies in class, and it is suggested that you keep a 'Research Investment Log' (RIL) to help you evaluate your input more objectively.

Data management and backups

Discuss with your supervisor their expectations and lab protocols for data recording and backups. Expect to provide the original of your lab notebook and both summarized and raw data in electronic format to them when you finish your thesis.

Computer failure or loss of data will not be grounds for accommodation or appeal. Keep off-site backups of your data. For your lab notebook, you might take a photo of each full page of your lab notebook, and back that photo up on the cloud. For data entered into spreadsheets, as well as drafts of your work, raw data in electronic format (e.g., electronic images), and collections of journal articles, ensure that these are backed up on the cloud, even if it is just by emailing them to yourself periodically (although there are much more satisfactory solutions).

Lightning talks

You will give two lightning talks in the Fall term during class. During the first one, tell us about your project. For the second one, provide an update of your research: what works what doesn't. Lightning talks are quick and to the point. You will have 2 minutes and one slide (NO animations) so make the most of it! Giving these talks is mandatory. If you miss a talk (without accommodation), there will be a 2% deduction on your course grade.

Health and Safety

Working in a safe environment is everyone's responsibility: the student, co-workers, and supervisor. No student will be allowed to start their research project until they have completed the necessary safety training. It is part of your supervisor's responsibility to ensure you have the appropriate training. Once you have completed the necessary training, you must provide your supervisor with proof of completion (e.g., certificate) for her/his records. Almost all training is offered on OWL:

- WHMIS
- Health and Safety Awareness (for workers)
- Safe Campus Community – preventing Harassment, Violence and Domestic Violence
- Accessibility in service (AODA)
- Mental Health

If you are working in a laboratory, you may also need to do one or more of:

- General Laboratory Safety and Hazardous Waste
- Biosafety
- X-ray safety
- Laser safety

And any additional training in animal handling and procedures or radiation safety, as required by your situation.

Accommodated Evaluations

If you cannot meet one of the deadlines for your reports, presentations, or thesis, you must discuss the situation with your thesis supervisor and the course instructor to set a new deadline. Course components will not be reweighed. Extensions of up to 5 business days can be granted by the instructor for written assignments only (not presentations). If longer extensions are required because of personal or health-related issues, you must seek accommodation from an academic counsellor in the Faculty of Science. If accommodation has not been arranged, late assignment will incur a penalty of 1% per day.

If your work is delayed because of circumstances of the research (e.g., equipment failure), you should engage your supervisor and talk to your course coordinator as soon as possible.

By taking this course, you are entering into a research agreement with your supervisor. You need to complete all the work and ensure you have the opportunity to submit everything. If you miss a deadline, it creates an imposition on your supervisor and readers who will need to assess your work later. Please be mindful of deadlines and plan your time accordingly.

If you have a legitimate reason (e.g., have obtained permission from the coordinator and academic accommodation) for missing a public presentation, the course instructor will try finding a new venue for you to give your presentation. In such a situation, your supervisor must attend the rescheduled presentation.

Weekly colloquiums

Students have to attend the **weekly colloquiums of the Earth Science Department**, which normally occur on Friday afternoons from 1:30 PM to 2:30 PM at BGS 0153, actively participate in the discussion and ask questions. Attendance will be recorded using iClicker. Colloquium topics are usually announced by the administrative assistant via email the week prior to the event.

Students need to attend >90% of these talks and ask 1-2 questions per talk for full marks in participation.

Responsibility Statement

Success in this course depends on proactive planning, clear communication, and personal responsibility. Please read these expectations carefully and refer to them throughout the term.

1. You are responsible for reminding your supervisor(s) and readers of upcoming deadlines, both in person and via email. Communicate very clearly the deadlines listed in this syllabus (sometimes you need to do that multiple times), along with instructions for sending required forms, grades, or comments directly to the course instructor at ashchep@uwo.ca. Keep in mind that professors are busy and can easily forget about those deadlines.
2. Late submissions will result in grade deductions as outlined in this syllabus. To avoid issues, plan to submit slightly ahead of the stated deadline.
3. Begin working on your thesis as early as possible. Hold regular meetings with your supervisor(s), attend lab meetings consistently, and ask a lot of questions whenever something is unclear.
4. If essential equipment is not functioning, identify this early. Work with your supervisor(s) to re-negotiate your research topic or arrange access to alternative equipment within this department or elsewhere on campus.
5. Arrive prepared and rehearse your presentations to meet the assigned time limit. I will stop the presentations exceeding the time limit.

Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Assessments worth less than 10% of the overall course grade:

For work worth less than 10% of the total course grade, the instructor may grant an extension.

Assessments worth 10% or more of the overall course grade:

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible.

For further information, please consult the University's medical illness policy at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf. The Student Medical Certificate is available at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf. Once valid medical or supporting documentation is submitted, the absence may be handled by the instructor by granting an extension.

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline, using the [Student Absence Portal](#).

All Academic Consideration requests normally must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course.

When a student mistakenly submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam).

See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

6. Additional Statements

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mappl13.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

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:

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

Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/advising/>

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced

sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.