Western Science

Integrated Science 4999E: Integrated Research Project
Course Outline: Fall/Winter 2024/25

1. Course Information

Course Title:	Integrated Science 4999E – Integrated Research Project
Lecture Section:	001
Description:	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.
Prerequisites:	Enrolment in Year 4 of the Western Integrated Science program.
Antirequisites:	Biology 4970F/G, Biology 4998E, Biology 4999E, Chemistry 4491E, Earth Sciences 4490E, Environmental Science 4970F/G, Environmental Science 4999E, Computer Science 4490Z, Physics 4999E.
Credits:	1.5
Meeting Times:	Tuesdays, 5:30 – 6:30 pm, PAB-36 (see meeting schedule below)
Delivery Type:	In-Person

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will 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:

Dr. Christina Booker
Department of Chemistry
Integrate Science Program
Office: CHB 21
cbooker2@uwo.ca

Dr. Jeremiah Shuster
Department of Earth Sciences
Integrated Science Program
Office: BGS 0164
jshuste3@uwo.ca

Email Response: We will strive to respond to your email within 24 hours on weekdays, but please allow up to 48 hours for a response. Please use your @uwo.ca email address and specify "**INTEGSCI 4999E**" within the subject of your email.

Office Hours: By appointment. Please email your instructor(s) to make an appointment.

3. Course Website & Materials

All course material will be posted to OWL: https://westernu.brightspace.com/. You will also be added to the OWL course site for your disciplinary thesis course.

There are no additional required materials for this course.

Students are responsible for checking the course OWL site (https://westernu.brightspace.com/) on a regular basis 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.

If this course is required to pivot online, you must have a stable internet connection and a computer with a working microphone and webcam.

4. Course Overview and Learning Outcomes

This capstone course gives you the opportunity to engage in an experimental or theoretical research project with interdisciplinary science components or applications. During this learning experience, you will design experiments, learn how to operate new instrumentation/programs, collect and analyze data, and communicate these results in a form report and presentation. This course grants you a new level of freedom to explore and research a new scientific area under the guidance of science faculty member.

By the end of this course, students should be able to:

- Apply scientific knowledge to a novel, interdisciplinary research project
- Propose creative, testable hypothesis and experimental designs
- Critically evaluate collected data and experimental approaches
- Discuss any limitations to data, experimental approaches, and/or assumptions
- Discuss interdisciplinary applications and considerations for a research project
- Reflect on your research progress and development as a researcher
- Communicate scientific research findings effectively and confidently both orally and in writing to academic and general audiences
- Integrate constructive criticism to improve research methodology and presentation.

5. Course Schedule

Below is the schedule of meeting times for the course.

Class	Class Meetings (Tuesdays, 5:30 – 6:20 pm)	Notes
1	Tuesday, September 17th	Course introduction with integrated science research connections (Connect with disciplinary thesis course and research supervisor prior to this meeting)
2	Tuesday, October 22nd	Integrated Science Career/Grad School Discussion (no preparation required)
3	Tuesday, November 12th	Three-minute thesis (no preparation required)
4	Tuesday, January 14th	Research progress updates (no preparation required)
5	Tuesday, February 25th	Discussion of research poster presentations (no preparation required)
6	*Friday* March 21st, *3:30-6:30 pm*	Integrated Science Research Conference (Poster presentations – submit poster on OWL by 2:30 pm)

6. Evaluation

Your grade for this course will be calculated by your departmental mark (from your discipline's fourth year thesis course) and the following integrated science components. The departmental mark will speak to the requirements of your home department; the integrated science mark will emphasize the interdisciplinary nature of your project. This arrangement ensures that you develop and highlight the interdisciplinary components of your work.

Assessment Component	Deadline	Weight
Home Discipline Deliverables		80%
Course Grade as calculated from your discipline's fourth year thesis course	Dates specified by your department	80%
Integrated Science Components		20%
Registration Form and Interdisciplinary Abstract	Friday, September 20th	3%
Mid-year Reflection	Friday, January 17th	6%
Poster Presentation	Friday, March 21st	11%

Home Discipline Deliverables

By enrolling in INTEGSCI 4999E, you are also shadowing your home discipline's fourth year thesis course. You will engage in all of the activities, deliverables, and due dates from your home discipline. Your final course grade from your home discipline will account for 80% of your INTEGSCI 4999E grade. If you have any questions or concerns with any of these components, first speak to your disciplinary faculty coordinator or research supervisor. If a problem persists, reach out to your instructors for INTEGSCI 4999E.

Integrated Science Components

The integrated components for this course are not meant to add to your workload, but to foster critical thinking and applications of your research in an interdisciplinary context. Some of these components will also overlap with deliverables that will be set by your discipline. See descriptions below.

Registration Form and Interdisciplinary Abstract

Registration form: Complete the template form provided on OWL, including the name and contact information for your supervisors, co-supervisors, advisors, and any other individuals involved in your thesis project and the title of your project. This is graded for completion. You must also submit a PDF copy of the course outline for your disciplinary fourth year thesis course.

Interdisciplinary Abstract: Prepare a brief summary of your proposed research project and highlight the anticipated interdisciplinary nature or applications of your work. The length should be one page with 1.5 line spacing.

Registration Form and Proposal/Abstract Components	**Grade**
Registration Form – complete	/1
Attach the course outline for your disciplinary fourth year thesis course	/1
Interdisciplinary Abstract – clear, informative summary of proposed research project	/4
Interdisciplinary Abstract – anticipated interdisciplinary nature and applications are thoughtfully discussed	/4
Total Grade	/10

Mid-Year Reflection

Submit a reflection on your fall term work and anticipated winter term activities. Prepare a visual **timeline** of fall-term achievements and anticipated next steps for the winter term. Include at least 10 meaningful items/points, such as major experiments, preparation of thesis introduction, presentation dates, important meetings/events. Then, write a **discussion** on your research progress, development as a researcher, challenges faced/overcome, and how your project has changed (or not) since you began. Finally, discuss the developing **integrated** nature of your work. Your reflection should be ~600 words (excluding your timeline).

Mid-Year Reflection	**Grade**
Timeline: Detailed overview of completed (fall term) and anticipated (winter term) tasks/ experiments/ milestones/ events/ thesis components/ challenges/ etc. presented in an organized, visually pleasing format.	/5
Discussion: Thoughtful, thorough, reflection on your research progress, development as a researcher, challenges encountered, and challenges overcome. Compare your current progress to initial plan/abstract.	/6
Integration: Discussion of how the interdisciplinary nature/ applications of your work have progressed.	/5
Engagement at INTEGSCI 4999E check-in meetings	/4
Total Grade	/20

Poster Presentation

Design an electronic poster for a general science audience (i.e., your colleagues in 1st – 4th year integrated science who have a science background but are not necessarily specialists in your field) to explain the importance of your research project. This poster presentation should discuss the background information around your project, your particular experiments/ contributions, and the interdisciplinary nature/applications of your project. You must upload a PDF copy of your poster to OWL 1 h prior to the start of the poster session.

Poster Presentation	**Grade**
The interdisciplinary nature and/or applications are highlighted and embedded throughout the presentation	/6
Background and context for this research project are clearly communicated for a general science audience	/5
Research contributions are explained for a general science audience	/5
Poster is organized, visually appealing, and balances text and images/headings	/3
Oral presentation of the poster captures the audience attention and guides audience through main poster points	/3
Grammar, spelling, and textual flow are easy to follow	/2
References	/1
Total Grade	/25

7. Tips for Success

Performing research is a new learning experience for most students. In order to have a successful year, we suggest the following:

- Seek help when you have questions or concerns. Don't just hold onto your questions – especially if they are about safety! Speak to your research supervisor, disciplinary course coordinator, integrated science course instructors.
- Prepare for any research meetings you have with your group or supervisor. Be ready to share your progress and any questions you have about the next steps of your project.
- Work diligently on your research each week. Plan to dedicate 10-15 hours in the lab or online to make progress on your project.
- Begin your written/presentation deliverables early! These tasks often take more time than you anticipate – especially if this is the first time you are completing this type of task. Give yourself time to brainstorm, write, edit, and reflect.
- Engage with the research members in your team. Use this opportunity to find out about their research and goals and to reflect upon your possible future in research.
- Attend and engage in the monthly integrated science meetings for this course to develop your integrated research perspective.

Again, if you have any questions or concerns along the way – reach out right away.

8. 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.

All Academic Consideration requests 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 assessments in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

Registration Form and Interdisciplinary Abstract, and Mid-Year Reflection: If extenuating circumstances apply, you may submit your work up to 48 h after the due date with no late penalty. If you are still unable to submit your work 48 h after the due date, email the instructor to discuss your submission. Academic consideration may be required to extend this due date. Otherwise, a 20% per day deduction will begin to apply 48 h after the due date. If you are unable to attend a class meeting, email the instructor to explain your situation and request a make-up activity to be submitted on OWL by a mutually agreeable date. Otherwise, your engagement for that missed class will be counted as zero on the mid-year reflection rubric.

Poster Presentation: If you are unable to present your poster on the designated poster day, obtain academic consideration and email the instructor to discuss an alternate presentation date and make-up assignment. Without academic consideration, a mark of zero will apply.

9. Statements and Policies

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/mapp113.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.

This course includes creative and written submissions. Be sure to cite all references and sources and complete your own work. If you have a question on whether or how to cite a source, ask your instructor!

All course assignments must be written in your own words. You may NOT submit an assignment produced by generative AI. The integrated science connections and reflection components of this course are only meaningful if you are the one preparing these submissions. You may use generative AI to edit or provide feedback on your work; however, your submitted work must be YOUR ideas communicated in YOUR own words. You must also follow the generative AI policies specified by your disciplinary thesis courses.

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/counselling/.

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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.

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

We value your feedback. Please feel free to provide feedback to your instructors in-person, email, or through OWL. Your feedback is welcomed and will remain confidential.