

DEPARTMENT OF CHEMISTRY

Chemistry 4491E

Chemical Research Discovery and Scientific Communication

Course Outline 2022-2023

Course Facilitators

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Please feel free to contact either of the course facilitators about any aspect of this course. Emails must be from your @uwo.ca address. Please put Chem 4491E in the subject line.

Course website: <http://owl.uwo.ca/portal>

Students should check OWL (<http://owl.uwo.ca>) 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. Students are responsible for checking OWL on a regular basis. All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Please follow chemistry on Twitter: **@WesternuChem** and join the conversation.

Course Overview

Chemistry 4491E is the capstone course in the Specialization and Honors Specialization in Chemistry modules and, for some, in the Honors Specialization in Biochemistry and Chemistry module. The course provides the student with the opportunity to integrate the breadth of knowledge gained in prerequisite courses and apply it towards a hands-on chemistry experience while doing an independent research project under the direction of a faculty member. The course involves experiential learning of advanced laboratory, computational and/or analytical skills needed to do research in an active chemistry research group. Importantly, the course also includes several lectures focused on self-marketing and other professional skills. The course culminates with the writing of a thesis summarizing the year's work. The honor thesis is then presented and defended in a conference-like atmosphere to a panel of faculty examiners and peers. The course experience wraps up with constructive revisions of the thesis suggested by faculty and submission of a final revised copy.

Notice from the Registrar: Unless you have either the prerequisites 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.

Prerequisites: Completion of the courses required for a Major in Chemistry and registration in a Specialization in Chemistry, Honors Specialization in Chemistry, or Honors Specialization in Biochemistry and Chemistry.

Anti-requisites: The former Chemistry 4490E.

Expectations. The following are course-specific conditions that are required to pass the course:

A) A minimum of 15 hours/week dedicated to the course. Activities include, but not limited to, preparation for experiments/calculations, performance of research, collection of data, analysis of results, participation in the group research activities, reading the literature, and communication of research results under the direction of your assigned mentor and/or supervisor. Please note that Friday, February 24, 2023 marks the end of your laboratory work. This is to allow enough time to write your thesis and prepare your final oral presentation. Urgent and critical make-up experiments are allowed under the agreement of your supervisors.

B) Attendance at the Chem 4491E Professional Skills unit presentations. In general, presentations are given on Thursday afternoons between 1:30 and 3:30 pm at NS 7. The specific schedule is given below. Some dates and times may be subject to change. Participation in each is required for course credit. Fail to attend will result in a failure in Chem 4491E. ***Reserve this time in your schedule weekly.***

C) Submission of the written thesis and oral presentation of your research project.

Initiation Meeting: Thursday, September 8, 2022, 1:30 pm, NS 7. The course initiation meeting will include a discussion of the course outline, expectations in research and required Laboratory Safety courses followed by a mixer where students can discuss research projects with potential faculty supervisors in an informal setting (see scheduling in tables for details).

Laboratory Safety: Students are required to complete a series of on-line laboratory safety training courses. In addition, your supervisor will provide group-specific safety training.

Learning Outcomes

- You will build on your project hypothesis/direction of research and, depending on the nature of the project, you will design and plan experiments, and/or modelling and computations. You will then execute this plan using the most appropriate methods.
- You will develop a basic understanding of research in the specific area of your project by reading the scientific literature
- You will integrate skills and knowledge learned during the core chemistry sub-discipline courses and apply them to your independent research project in an active research group
- You will apply the knowledge acquired during your chemistry module and/or new knowledge acquired during your research project to interpret your results and to rationalize them in the context of your hypothesis
- As a part of an active research group, you will develop skills for working within a team
- You will refine your scientific writing skills through the writing of a thesis
- You will refine your communication skills through regular, active participation in research group activities, and through oral presentations and defense of your honor thesis
- You will develop professional career skills, such as self-marketing skills, job application skills, interviewing and networking skills, and advanced library skills, through a series of active learning/participatory events

Research Schedule. Important dates for in-person for research progress evaluations, thesis and oral presentation components.

Event	Date and place for in-person event
Introduction to 4491 and Mixer ZD and AP will introduce the course. This will be followed by a meet-and-greet with potential 4491 supervisors	Thursday, September 8, 2022, NS 7, 1:30 pm Meet-and-greet at 3:30-5:30 pm with faculty in the Courtyard in the middle of the MSA/B&G buildings on the ground floor, weather permitting. If not, the meet-and-greet will take place in the MSA Atrium on the 1 st floor.
Project Selections Due	Friday, September 9, 2022, by 5:30 pm, Electronic submission in OWL
Release of project assignments	Monday, September 12, by 5:30 pm
Start of research	Tuesday, September 13 Students should contact their assigned thesis supervisors.
Mid-Year presentations	Thursday, December 01, 2022, NS 7 & ChB 115, 1:30-3:30 pm
Thesis Introduction Due	Monday, December 5, 2022, by 5:00 pm. Students will submit a copy via OWL and a copy directly to the supervisor.
Submission of Thesis	Wednesday, March 22, 2023 by 5:00 pm, Electronic submission of thesis via OWL. Hard Deadline
Thesis Oral Presentation CHEM4491 Day	Saturday, April 1, 2023, 8:30 am-3:30 pm, location TBA

Revisions Requested by Examiners/Supervisors	Tuesday, April 18, 2023, Electronic communication
Final Thesis Submission	Friday, April 28, 2023, 11:55 pm, Final revised thesis to be uploaded via OWL

Professional Skills Presentation Schedule

NB: *tentative* dates – any changes will be announced via email (OWL). Slides of all presentations will be uploaded on OWL after all lectures.

Event	Date and Location
<p>Introduction to 4491 and Mixer ZD and AP will introduce the course. This will be followed by a meet-and-greet with potential 4491 supervisors.</p>	<p>Thursday, September 8, 2022, NS 7, 1:30 pm</p> <p>3:30-5:30 pm Meet-and-greet with faculty in the Courtyard in the middle of MSA and the B&G buildings on the ground floor. If weather does not allow the meeting in the courtyard, it will take place in the MSA Atrium on the 1st floor.</p>
<p>Library Session Shiyi Xie (sxie28@uwo.ca) NOTE: Please register for your SciFinder account BEFORE this class session. Registration details here: https://guides.lib.uwo.ca/chem4491e/primaryliterature</p>	<p>Thursday, September 15, 2022</p> <p>The session will take place in Taylor Instruction Room at Taylor Library at 1:30 pm. <i>Bring a laptop computer with you.</i></p>
<p>Graduation Audit G. Kochhar, Chair of Undergraduate Counselling and Adjudication (gkochhar@uwo.ca)</p>	<p>Thursday, September 22, 2022, NS 7 at 1:30 pm <i>Bring a laptop computer and/or student profile with you.</i></p>
<p>How to give a Scientific Presentation and Prepare to Write a Thesis A. Paul</p>	<p>Thursday, September 29, 2022, NS 7 at 1:30 pm</p>
<p>Sustainability Y. Hedberg</p>	<p>Thursday, October 6, 2022, NS 7 at 1:30 pm</p>
<p>Applying to Graduate Schools & Applying for Graduate Scholarships</p>	<p>Thursday, October 13, 2022, NS 7 at 1:30 pm</p>

F. Lagugné-Labarthe and J. Gilroy	
Self-Marketing on Paper: Resumes and Cover Letters Afa Awobajo	Thursday, October 20, 2022, NS 7 at 1:30 pm
Self-Marketing On-line: LinkedIn Workshop Afa Awobajo	Thursday, October 27, 2022, NS 7 at 1:30 pm <i>Bring a laptop computer with you.</i>
Sign-up for the Mock interview	Choose Job Posting (Record Job ID # for future use) Select and Open Interview Timeslot Complete by Monday, December 12, 2022
Apply for the Mock Job	Submit Resume and Cover Letter (Job Application) Complete by Sunday, January 8, 2023 <i>Please contact Ms. P. Mason (pmason7@uwo.ca) if you have difficulties</i> Hard Deadline: must include complete LinkedIn profile
Self-Marketing in Person: Networking Interview Skills Workshop P. Mason	Thursday, January 12, 2023,
Mock Interview Day (10 am-5 pm)* *includes interview and networking meeting	Thursday, January 19, 2023, Interview Times TBA followed by the networking meeting – Location TBA
Looking Ahead: Time Management and SOUSCC Z. Ding	Thursday February 2, 2023, NS 7 at 1:30 pm
SOUSCC Conference 2023	SOUSCC is normally held on a Saturday in March before 4491 Day; it is an all-day event. Probable Date: March 25, 2023. <i>(optional, but strongly recommended!)</i>

Course Evaluation

Assuming the minimum requirements as outlined above are met, the final grade in the course (out of 100%) will be determined as follows:

Mid-year Research Project Progress Presentation: 5%

Each student will give a **5-Minute oral presentation** (approximately 4-5 slides, excluding the title and final acknowledgment slides) outlining the research problem under study, the research objectives and progress to date. The presentation will be followed by questions from the course coordinators and the audience. The presentation will be graded by a course coordinator. Students are referred to the oral presentation rubric for guidance.

Mid-year Preliminary Thesis Introduction: 5%

A preliminary draft of the thesis introduction will be submitted to your supervisor(s) and on OWL. The objective of this evaluation element is to ensure that you are thinking about the nature and scope of your research project. The exact length and content of the introduction may change in the final thesis. Typically, an introduction will be 4-6 pages. The introduction will be graded by the supervisor(s). Students are referred to the thesis rubric for guidance.

Mid-year (December) Student Performance Grade: 5%

Assigned by the supervisor(s) based on the student's performance in the research project to date. Students are referred to the student performance rubric for guidance.

Final Student Performance Grade: 25%

Assigned by the supervisor(s) based on the student's performance in the research project throughout the entire academic year. Students are referred to the student performance rubric for guidance.

Thesis Grade: (2 x 15% by each thesis examiner) 30%

Each student will submit a formal, written thesis by the due date. The thesis will be read and evaluated by two faculty members (who are not supervisors of the project) using the thesis evaluation rubric. The thesis grades are submitted to the coordinators prior to the oral presentation.

Oral Presentation Grade: 30%

Each student will present a 14 – 15 minute formal oral presentation. Your thesis examiners, and any other faculty members present (other than your supervisor(s)), will provide a grade based on the quality of the presentation according to the oral presentation rubric. At the end of the student's presentation, each examiner will ask questions for a maximum time period of 10 min.

Accommodation and Accessibility

Accessible Education

- Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf
- 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 Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Accommodation for Medical Illness or other Serious Circumstances

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reporting of absence or via the Dean's Office/Academic Counselling unit of your Home Faculty. The Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca. You must also discuss the situation with the course coordinators to identify an alternate task to make up for the missed course requirement.

For further information, please consult the university's policy on academic consideration for student absences:

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

Academic Consideration for Student Absence

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are

compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

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

and for the Student Medical Certificate (SMC), see:

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

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

Academic Policies

The website for Registrarial Services is <http://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 his/her official university address is attended to in a timely manner.

Scholastic offences

Scholastic offences, including plagiarism, 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.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience) (see contingency plans in Table 1 and 2). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

Support Services

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

Managing academics and well-being: 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/>.

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

Improvement of writing skills: The *Writing Support Centre* can help students to improve their writing skills. Writing resources and/or expert writing counsellors are available to you. (<http://www.sdc.uwo.ca/writing>).

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

Important Academic Dates (Sept 2022 – April 2023)

Note: Changes may apply in the dates by the University due to COVID-19

- September 8 – Classes begin
- October 10 – Thanksgiving Holiday
- October 31 to November 6 – Fall Reading week
- December 8 – Fall classes end
- January 9, 2023 – Classes resume
- February 18-26, 2023 – Spring Reading week
- February 20 – Family Day
- April 07 – Good Friday
- April 10 – Classes end
- April 11-12 – Study Day
- April 13-30 – April examination period