

DEPARTMENT OF CHEMISTRY

Chemistry 4491E

Chemical Research Discovery and Scientific Communication

Course Outline 2023-2024

Course Facilitators

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Please use the OWL messaging to contact the course facilitators about any aspect of this course. If you must email, then 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 519-6613800 or ext. 83800.

We acknowledge that Western University is located on the traditional lands of the Anishinaabek (Ah-nish-in-a-bek), Haudenosaunee (Ho-den-no-show-nee), Lūnaapéewak (Len-ahpay- wuk) and Attawandaron (Add-a-won-da-run) peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. This land continues to be home to diverse Indigenous peoples (e.g. First Nations, Métis and Inuit) whom I recognize as contemporary stewards of the land and vital contributors of our society.



This Chemistry-Progress Pride logo is used with permission of the University of Michigan and is partially credited to artist John Megahan. It combines the Progress Pride flag with the periodic table. The Progress Pride flag was designed by Daniel Quasar, who identifies as queer and nonbinary. It combines the traditional gay pride flag with the white, pink, and light blue reflect the colors of the transgender flag, and brown and black stripes representing people of colour. The idea of “you are welcome here” is to highlight that **we are committed to ensure #Chem4491 is a safe place for all.**

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 workshops focused on self-marketing and other professional skills. The course culminates with the writing of a thesis summarizing the year's work. The thesis is then presented and defended in a conference-like atmosphere to a panel of faculty and peers. The course experience wraps up with constructive revisions of the thesis suggested by faculty and submission of a final revised copy.

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, March 1, 2024 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. The specific schedule is given below. Some dates and times may be subject to change. Participation in each is required for course credit. Failure to attend can result in an F in Chem 4491E. ***Reserve this time in your schedule weekly.***
- C) Submission of the written thesis and oral presentation of your research project at the 52nd SOUSCC.

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 world class 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 of your thesis.
- You will develop professional career skills, such as self-marketing skills, job application skills, interviewing and networking skills, commercialization, and advanced library skills, through a series of active learning/participatory events

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

Event	Date and place for in-person event
Introduction to 4491 and Mixer Course facilitators will introduce the course and expectations. This will be followed by a meet-and-greet with potential 4491 supervisors	Thursday, September 7, 2023, 1:30 pm This initial 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). 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 8, 2023, by 5:30 pm, Electronic submission in OWL
Release of project assignments	Monday, September 11, by 5:30 pm on OWL
Start of research	Tuesday, September 12 Students should contact their assigned thesis supervisors.

Your research on Social Media	First Due no later than Nov. 20 Second Due no later than February 28
Mid-Year presentations	Thursday, Nov. 30, 2023, 1:30-3:30 pm
Chemistry Mentorship Report 1 Due	Thursday, December 7, 2023, by 7:00 pm Students will submit a copy via OWL
Thesis Introduction Due	Thursday, December 7, 2023, by 7:00 pm. Students will submit a copy via OWL and a copy directly to the supervisor.
Final Day in Lab for Experimentation	Friday, March 1 2024
Chemistry Mentorship Report 2 Due	Thursday, March 7, 2024, by 7:00 pm. Students will submit a copy via OWL.
Submission of Thesis	Monday, April 1, 2024 by 5:00 pm, Electronic submission of thesis via OWL. <i>Hard Deadline</i>
Thesis Oral Presentation CHEM4491 Day	Part of 52 nd SOUSCC Saturday, April 6, 2024, 8:00 am-9:00 pm, BOOK off this day.
Final Thesis Submission	Friday, April 30, 2024, 6:00 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</p> <p>The course Coordinators will introduce the course and its expectations. This will be followed by a meet-and-greet with potential 4491 supervisors.</p>	<p>Thursday, September 7, 2023, NCB 117, 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: Allana Marson Teaching and Learning Librarian</p> <p>NOTE: Please register for your SciFinder account BEFORE this class session.</p>	<p>Thursday, September 14, 2023 2:30 START</p> <p>Academic Integrity and SciFinder</p> <p>The session will take place in Taylor Instruction Room at Taylor Library at 2:30 pm. <i>Bring a laptop computer with you.</i></p> <p>Registration details here: https://guides.lib.uwo.ca/chem4491e/primaryliterature</p>
<p>Library Session: Allana Marson</p>	<p>Thursday, September 21, 2023</p> <p>Research Management Skills: How to Use a Bibliography Manager</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>Applying to Graduate Schools & Applying for Graduate Scholarships</p>	<p>Thursday, September 28, 2023, NCB 117 at 1:30 pm</p> <p>Guests: F. Lagurné-Labarthet and J. Gilroy</p>
<p>Introduction to Self-Marketing and Professionalism</p>	<p>Thursday, October 12, 2023, NCB 117 at 1:30 pm</p> <p>Guest: Patrica Mason FoS</p>

Self-Marketing on Paper: Resumes and Cover Letters	Thursday, October 19, 2023, NCB 117 at 1:30 pm Guest: Patricia Mason, FoS
Self-Marketing On-line: LinkedIn Workshop	Thursday, October 26, 2023, NCB 117 at 1:30 pm <i>Bring a laptop computer with you.</i> Guest: FoS
Research to Commercialization- Worlddiscoveries	Thursday Nov. 16 or 23. NCB 117 Guest: TBA
Sign-up for the Mock interview	Choose Job Posting (Record Job ID # for future use) Select and Open Interview Timeslot Complete by Monday, December 11, 2023 11:59 p.m
Apply for the Mock Job	Submit Resume and Cover Letter (Job Application) Complete by Monday January 8, 11:59 p.m. <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	Thursday, January 11, 2024 NCB 117 Guest: Patricia Mason, FoS
Mock Interview Day 10 am-3 pm *you will be assigned a 45 min interview slot 3:00-5:00 Networking Reception	Thursday, January 18, 2024, Interview Times TBA followed by the networking reception – NCB Location TBA

<p>Thesis Writing and Conference Team 4491</p>	<p>Thursday February 8, 2024, NCB 117 at 1:30 pm</p>
<p>Mustang's Corral- Pitch Your Thesis in 3 minutes</p>	<p>Thursday February 15, 2024, NCB 117 at 1:30 pm</p> <p>Each student will pitch their thesis using ONE slide and maximum 3 minutes to a panel and their peers.</p>
<p>52nd SOUSCC Conference 2024</p>	<p>Saturday, April 6, 2024 it is an all-day event. Book it! <i>Location FNB, HSB and Great Hall</i></p>

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: **7%**

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 and peers.

Mid-year and Year End Research Social Media Project **6%**
(3% for each post)

In a format suitable for posting on social media (image and short text with #) describe your research project or some interesting aspect of it (an experiment, instrumentation). Submit to OWL suitable for posting on Chemistry Socials.....and on your LinkedIn page. The deadlines are listed above.

Chemistry Mentorship and Engagement **6%**

Didn't you wish you had someone in upper year chemistry to talk to when you were starting in Year 2? Well, this component is meant to initiate that program this year. You will be assigned to a couple of second year students as a mentor. You will meet with them at least twice a term informally to help guide them and get feedback on their experience in our program. A short report will be required in Dec. and March to highlight your activities.

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 with schemes and figures. 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.

Mustang's Corrale- Pitch Your Thesis

6%

In one slide (and props if you want) pitch your thesis to try to get us to want to invest in the work.

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 12.5% by each thesis examiner =

25%

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:

15%

Each student will present a 15-minute formal oral presentation at SOUSCC. Your thesis examiners, and other faculty members present (other than your supervisor(s)), will provide a grade based on the quality of the presentation according to an oral presentation rubric. At the end of the student's presentation, the audience will ask questions for about 5 min.