

Chemistry 398, Senior Thesis Fall Semester

Student Time Commitment: 10-15 hours of research-related work Park 276	<i>Professor Contact Information:</i> Dr. Eugenia S. Vasileiadou Office: Park 288, E-mail: evasileiad@brynmawr.edu
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Course Description: CHEM 398 is the first semester of a sequence aimed at giving undergraduate students first-hand experience with rigorous laboratory research in chemistry and scientific writing. In conjunction with Dr. Vasileiadou, students will have the opportunity to pursue independent projects related to inorganic materials research that is ongoing in the Vasileiadou Research Group. This includes designing and implementing experimental protocols, learning and honing foundational materials chemistry techniques, becoming familiar with the requisite literature and reporting your own discoveries in various ways. This first semester course is focused on students' learning and collecting the bulk of the research data necessary for their senior thesis. The second semester (CHEM 399, Spring semester) will be focused on summarizing students' independent work in a senior thesis and oral presentation.

Learning Goals:

- Expand capabilities at designing, completing, and analyzing data from inorganic materials chemistry experiments.
- Gain practice and expertise in reading, interpreting, and synthesizing information from literature sources related to the independent senior project topic.
- Develop improved scientific communication skills via various means, including subgroup meeting presentations, public presentations, conference attendance, and written communication.

Expectations:

- Students will engage in 10-15 hours of research-related activities per week. Students are responsible for their own schedules and for meeting the weekly hours quota. "Research-related activities" include, but are not limited to, conducting laboratory experiments, plotting and analyzing data, reading the primary literature, researching future chemistry-related endeavors, drafting thesis sections, etc.

- Students will submit pre-drafts of specific sections of their thesis as outlined in the schedule below for peer review and feedback from Dr. Vasileiadou. All drafts should include appropriate citations.
- Students are expected to attend lab subgroup meetings and present literature-based and research-based presentations during the semester.
- Students will be good lab citizens, which includes but is not limited to, keeping common areas clean, contributing to group discussions and lab cleaning, adhering to routine data management procedures, mentoring younger students, etc.
- Students will meet with Dr. Vasileiadou for ~30 minutes at least twice a month to discuss progress and ongoing experiments.
- Students will attend Chemistry department colloquia (<http://www.brynmawr.edu/chemistry/>).

Lab Safety is required – Students will attend mandatory annual safety training sessions. Always use safe laboratory practices, including:

- Proper personal protective equipment, when appropriate. As a guideline:
 - Closed-toed shoes: always
 - Gloves: Dispose of gloves when leaving the laboratory – do not touch door handles with gloves.
 - Safety goggles
 - Lab coat
- Hazardous waste disposal:
 - Chemical waste
 - Biohazardous waste

A “4.0” student:

- Is independent: takes ownership of their project and can brainstorm experiments, carry them out, and interpret results on their own, without continual guidance and external pressure.
- Assists and trains fellow lab members.
- Keeps a comprehensive, well-organized, and up-to-date lab notebook with plotted data and weekly conclusions.

- Exhibits high productivity and efficiency, being responsible with research schedule and with productive lab time of at least 10 hrs/week.

Access and Accommodations: Bryn Mawr College is committed to providing equal access to students with a documented disability. Students needing academic accommodations for a disability must first register with Access Services. Students can call 610-526-7516 to make an appointment with the Access Services Director, Deb Alder, or email her at dalder@brynmawr.edu to begin this confidential process. Once registered, students should schedule an appointment with me as early in the semester as possible to share the verification form and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement. Any student who has a disability-related need to tape record this class must first speak with the Access Services Director and to me, the instructor. Because of laws within the State of Pennsylvania, class members need to be aware that this class may be recorded.

Policy for the use of AI in this course:

Use of any text-generating software (such as ChatGPT, iA Writer, Marmot or Botowski) is not permitted, and use of this software on graded assignments will be treated as plagiarism.

Title IX: Bryn Mawr/Haverford College is committed to fostering a safe and inclusive living and learning environment where all can feel secure and free from harassment. All forms of sex discrimination, including sexual assault, sexual harassment, stalking, domestic violence, and dating violence, are violations of Bryn Mawr/Haverford's policies, whether they occur on or off campus. Bryn Mawr/Haverford faculty are committed to helping to create a safe learning environment for all students and for the College community as a whole. If you have experienced any form of gender or sex-based discrimination, harassment, or violence, know that help and support are available. Staff members are trained to support students in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more.

The College strongly encourages all students to report any incidents of sexual misconduct. Please be aware that all Bryn Mawr/Haverford employees (other than those designated as confidential resources such as counselors, clergy, and healthcare providers) are required to report information about such discrimination and harassment to the [Bi-College Title IX Coordinator](#).

Information about the College's Sexual Misconduct policy, reporting options, and a list of campus and local resources can be found on the College's website: [Bryn Mawr Sexual Misconduct Policy](#).

Tentative Senior Thesis Timeline (Academic Year 2026-2027):

- **September:** Meet with Dr. Vasileiadou for thesis project planning, experimental goals and outline. Training in foundational experiments undertaken. Core literature papers identified.
- **October:** Experimental progress on independent research project goals. Formal data plotting and analysis of conclusive experiments that are ready to be transferred into senior thesis draft.
- **November:** Concluding the “complex” research experiments. Formal data plotting and analysis of experiments that are ready to be transferred into senior thesis draft.
- **Dec 13-18:** Meet with Dr. Vasileiadou to discuss the Introduction draft of senior thesis & thesis writing plan for Spring semester. Set goals for Introduction draft to be completed by January.

Spring semester will include research time for wrapping up the experimental work of your senior thesis and largely writing the draft of your senior thesis.

- **Feb. 1-5:** Send (via e-mail) a draft of your **Introduction** section to Dr. Vasileiadou for record-keeping purposes; together, this section will likely range from 5-15 pages and should include correctly formatted citations. All figures should have legible labels and concise legends.
- **Feb. 22:** Send (via e-mail) a draft of your **Methods and Results** sections for peer review. Please copy Dr. Vasileiadou on e-mail communications for record-keeping purposes; together, these sections will likely range from 10-20 pages and should include correctly formatted citations. All figures should have legible axis labels and concise legends.
 - **For this peer review:** Monica ↔ Aden; Hannah ↔ Marlana
- **March 2:** Send (via e-mail) comments/revisions on your peer reviewed **Methods and Results**. Please copy Dr. Vasileiadou on e-mail communications for record-keeping purposes; these comments should include both big-picture ideas/advice and grammar/diction-level feedback.
- **March 22:** Send (via e-mail) a draft of your **Discussion** section for peer review. Please copy Dr. Vasileiadou on e-mail communications for record-keeping purposes; together, these sections will likely range from 8-15 pages and should include correctly formatted citations. All figures should have legible axis labels and concise legends.

- ***For this peer review:*** Monica ↔ Hannah; Aden ↔ Marlana
- ***March 29:*** Send (via e-mail) comments/revisions on your peer reviewed ***Discussion***. Please copy Dr. Vasileiadou on e-mail communications for record-keeping purposes; these comments should include both big-picture ideas/advice and grammar/diction-level feedback.
- ***April 19:*** Send a draft of your ***entire thesis*** to Dr. Vasileiadou, along with 2-3 suggestions for a second reader.
- ***May 3:*** Submit the ***final draft of the thesis*** to Dr. Vasileiadou and your second reader.
- ***End of Spring Semester:*** Present your thesis research in a talk to the entire department.

- ❖ Students will present an oral presentation on their research project at the Tri-Co Materials Chemistry symposium in Spring 2027 and attend the keynote lecture. Date will be announced.