



School of Arts and Science
Chemistry Department
CHEM498
Comprehensive Exam
0 Credits
AY2025

COURSE SPECIFICS

Course Description

The Chemistry Comprehensive exam takes the form of a required poster and a voluntary seminar focused on literature research performed throughout the Academic Year (AY). Topics for the poster and seminar will be suggested by faculty or will be the topic of a laboratory research project. Topics will be selected at the beginning of the AY and the exams will occur in April. Between these times, students will meet regularly with their advisor, who is the faculty who suggested the topic or who is supervising the laboratory research project. All students must complete their comprehensive exam before graduation and typically this will be performed in their Senior year. Students may request permission to enroll and complete their comprehensive exam in the Junior year or may elect to select a project and begin their work on their project in their Junior year and complete their comprehensive exam in their Senior year. If a comprehensive exam is unsuccessful, one additional attempt may be made in any AY.

COURSE GOALS

Objectives

In this course, students will:

- Perform an extensive literature review of a chemistry-focused topic
- Have discussions with faculty about their chemistry-focused topic
- Present their research to the chemistry department

Outcomes

Successful completion of this course will enable students to:

- Perform advanced literature research
- Presentation of research at a university scientific conference
- Demonstrate understanding of the chemistry in a research project

INSTRUCTIONAL DELIVERY

Location and Instruction Mode list and definitions are available at [Enrollment Service webpage](#)

- **Course Location:** MAIN
- **Instructional Modes:** Synchronous (S); Asynchronous (A); Synchronous & Asynchronous (SA); Directed Research (DR);

CONTINGENCY PLANNING

In the event that a student must shift to online attendance for health reasons, either temporarily or for the remainder of the semester, the student must notify the instructor immediately. In the event that the university as a whole, or this course in particular, must shift to entirely online course delivery, the following adjustments will be made to the mode of instruction, assignments, and assessments in this course:

INSTRUCTIONAL METHODS AND COURSE REQUIREMENTS

Required and Recommended Materials

Required materials are at the discretion of each student's comprehensive exam advisor.

Class Policies

- Attendance
 - Students are required to meet with their comprehensive exam advisor at least once per month between project selection and the exam.

Grades

- Comprehensive exams are PASS/FAIL with opportunities for HIGH PASS and PASS WITH HONORS, depending on the activities the student chooses and their performance in those activities (see below)

The University grading system is available:

- [Undergraduate policies on grades and academic standing](#)

- [Graduate policies on grades and academic standing](#)

Reports of grades in courses are available at the end of each term in [Cardinal Students](#)

Assessment of Learning

- Students will be evaluated based on their participation in meetings with their advisor, their performance at the final exam, and optionally, University Research Day.

COURSE SCHEDULE AND BIBLIOGRAPHY

- Topic Presentation meeting: August 29, 2024
- Topic Selection deadline: September 6, 2024
- Meetings with Advisors (by the end of the first full week of each month):
 - October 7-11, 2024
 - November 4-8, 2024
 - December 2-6, 2023
 - January 13-17, 2025
 - February 3-7, 2025
 - March 3-7, 2025
- January 2023: All students expecting to complete their comprehensive exam at the end of the AY must be enrolled in CHEM 498.
- Digital poster Due: Two weeks before Chemistry Day TBD. Mid-late March.
- Chemistry Day (oral and poster presentations): TBD. Early/mid-April
- Delivery of exam results: mid-late April

C. Topic Selection

Topics for comprehensive exams come from two sources: the topic of ongoing or past undergraduate research performed by the student or a topic proposed by chemistry faculty and selected by the student. In either case, the exam will take the form of a literature review which may be supplemented with experimental data if the topic includes laboratory research performed by the student. If the project is based on laboratory research, it may be research performed in any lab in the Chemistry department or in a lab outside the chemistry department. If it is the latter, permission must be given by the department in writing to use this as the topic. Topics related to any aspect of chemistry faculty research shall be permitted with the understanding that (1) the project must include substantial chemistry content and (2) the exam may test students' knowledge of any area of chemistry related to that project.

At the beginning of the AY, chemistry faculty and Seniors will hold a meeting to discuss comprehensive exam topics. Juniors and other chemistry majors will also be invited so the exam process is transparent to all our majors and to allow our Juniors to decide if they would like to embark on the process in the current AY. Each faculty will present the ideas and scopes for their proposed projects (2-4 minutes per project), will answer any questions, and will offer students one

paper (PDF by email) that helps acquaint students with the background to the project. Over the next week, faculty and students will discuss projects and, through mutual agreement, decide which students will work with which faculty. These agreements should be reported to the department to ensure all students have selected a topic and have been accepted by a faculty member.

D. Advising Process

Students are required to meet with their faculty advisors during the first week of each calendar month between topic selection and the exam. Additional meetings may take place at the request of the student or the faculty advisor. Participation in this process is required (see evaluation, below).

E. The Exam: Chemistry Day Presentations

The compulsory component of the comprehensive exam is a poster presented during Chemistry Day. Chemistry Day will take the form of a departmental conference with oral presentations and posters. The poster session will allow sufficient time for all faculty to meet with every student presenting their comprehensive exam and discuss their posters. Poster planning and design may begin in CHEM405. Presentations of posters are typically to a small audience (1-2 people) at a time for 4-6 minutes and allows for up to 10 minutes of questions. All faculty will visit all posters for a presentation and question period. Students may opt to present an oral seminar at Chemistry Day in addition to the poster presentation. Comprehensive exam seminars will be 15-minutes in length + 5 minutes of questions. This seminar is in addition to the required poster presentation. Events may be changed to virtual at the discretion of the chemistry department or the University.

F. Evaluation of Exams

Comprehensive exams will be evaluated by faculty and graded on a scale from Fail through Pass, High Pass, and Pass with Honors. Each grade will have a set of criteria specific to that level (see below). All criteria must be met to be awarded that grade. The criteria for each level may include meeting with a faculty advisor throughout the AY, poster preparation, poster presentations, and a seminar presentation. Students will be given access to an online progress page where they can track their progression through the steps of the exam. Students receiving Pass with Honors will receive an award from the department and will be recognized on a "Hall of Fame" on our website and in the department. At the end of each AY, a reception shall be held to celebrate students who completed our most successful comprehensive exams.

To be awarded a **Pass with Honors**, students must complete ALL the following:

- (1) Meet each month with their faculty advisor, ideally during the first week of each month.
- (2) Submit a digital poster to faculty, which is graded as a PASS by all faculty and Excellent by $\geq 50\%$ of faculty.
- (3) Present a poster at Chemistry Day which is graded as a PASS by all faculty and Excellent by $\geq 50\%$ of faculty.
- (4) Present a seminar at Chemistry Day which is graded as a PASS by all faculty and Excellent by $\geq 50\%$ of faculty.
- (5) Apply to present, and present (if accepted) a poster or seminar at URD (April 18, 2023).

To be awarded a **High Pass** students must complete ALL the following:

- (1) Meet each month with their faculty advisor, ideally during the first week of each month.
- (2) Submit a digital poster to faculty, which is graded as a PASS by all faculty and Excellent by $\geq 50\%$ of faculty.
- (3) Present a poster at Chemistry Day which is graded as a PASS by all faculty.

- (4) Present a seminar at Chemistry Day which is graded as a PASS by all faculty.
- (5) Apply to present, and present (if accepted) a poster or seminar at URD (April 18, 2023).

To be awarded a **Pass** students must complete ALL the following:

- (1) Meet each month with their faculty advisor, ideally during the first week of the month, and miss no more than 2 meetings.
- (2) Submit a digital poster to faculty, which is graded as a PASS by $\geq 50\%$ of faculty.
- (3) Present a poster or seminar at Chemistry Day which is graded as a PASS by $\geq 50\%$ or more of faculty.
- (4) Apply to present, and present (if accepted) a poster or seminar at URD (April 18, 2023).

A comprehensive exam is graded as a FAIL if ANY of the following occur:

- (1) A student misses >2 meetings with their faculty advisor.
- (2) A student fails to submit a digital poster, or the submitted poster is graded as a FAIL by $\geq 50\%$ of faculty.
- (3) A student's poster presentation fails to be awarded a PASS by $\geq 50\%$ of faculty.

G. Supplementary Exams

Unsuccessful exams will require a supplementary exam. Supplementary exams will take a form determined by the faculty who voted during the Chemistry Day exam. Exams may take any form, e.g., an oral exam focused on the chemistry of a research article the student used as source material for their comprehensive exam. No more than two attempts to pass the comprehensive exam are permitted in any academic year, therefore, only one attempt may be made to pass the supplementary exam.

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UNIVERSITY POLICIES

All of Catholic University's policies are detailed at [Catholic University Policy Webpage](#).

Academic Integrity

Academic dishonesty at The Catholic University of America is not tolerated. As such, academic integrity is not merely avoiding plagiarism or cheating, but it certainly includes those things. Academic integrity means, above all else, taking responsibility for your work, your ideas, and your effort, and giving credit to others for their work, ideas, and effort. If you submit work that is not your own – whether test answers, whole papers, or something in-between – that is considered to be academic dishonesty. University procedures related to academic dishonesty are conducted with respect and dignity, while also preserving accountability, and they presuppose that all participants will treat each other with respect and dignity.

- [Undergraduate Student Academic Dishonesty Policy](#)

- [Graduate Student Academic Dishonesty Policy](#)

Grades and Academic Standing

- [Undergraduate policies on grades and academic standing](#)
- [Graduate policies on grades and academic standing](#)

University Recording Policies

- [Recording Classroom Lectures Policy](#)
- [CUA Recording Policy](#)

Accommodations for students with disabilities

- Any student who feels they may need a reasonable accommodation based on the impact of a disability should contact the Office of Disability Support Services ([Office of Disability Support Services](#)) by emailing at CUA-DSS@cua.edu