Honors

Students who wish to pursue Honors in the chemistry major must fulfill three criteria:

1. Candidates must have a minimum GPA of 3.40 in all classes pertaining to the major, including math and physics. Alternatively, they may petition the department for special dispensation based on unusual circumstances.
2. Complete *a minimum of* one summer or two semesters of research with at least one Dickinson chemistry faculty member on a single/contiguous project. Candidates must have an on-campus mentor during Honors research activities, including preparation of the thesis and defense presentation.
3. Satisfy the expectations of the department with respect to the quality of the Honors proposal, oral defense, and the Honors thesis.

Criteria for Honors in Chemistry

The faculty will consider awarding Honors to a chemistry major based on the candidate's complete undergraduate chemistry record. This includes all courses required for the major, the student's grades, and the successful completion of a two-semester (or summer) research project. A minimum GPA of 3.40 is required in all courses that count toward the major, including math and physics courses and transfer courses that receive chemistry credit, typically at the conclusion of the seventh semester (the fall semester of the senior year) of study. A project under consideration for Honors is distinguished from other research in the degree of ownership the student develops. The student is not merely conducting experiments set out by the advisor—they are contributing to experimental design, data analysis, troubleshooting, and review of the literature such that they have clear intellectual investment in the project. Generally, an Honors thesis should be of publishable or near publishable quality, even allowing for negative results that are not typically part of published work. The Honors thesis contributes to the overall progress of the research agenda and represents necessary experimental work in the pursuit of publications by the faculty member. The Chemistry Department faculty will weigh all of these factors when considering Honors with specific criteria described in the following.

Procedures (Applying for Honors in Chemistry)

1. A draft of the research proposal must be submitted to the faculty research advisor by the final class day of the student's seventh semester. The faculty advisor will assist the student in revisions of the proposal prior to sharing it with the department.

2. The faculty advisor, on behalf of the student, will share the proposal with the department by the end of the first week of the spring semester, allowing at least one week for review. The research proposal must follow the format specified in the Proposal Guidelines.

3. At the next department meeting, the Chemistry faculty will discuss the student's proposal and make a determination as to whether or not the student is approved to proceed towards Honors. The student will be informed of the department's decision within 1-2 weeks of receiving the proposal. For serious but limited concerns about the project or proposal, the department may require revisions to the proposal with a due date for revisions that are contingent for the potential acceptance of the proposal. A maximum of one set of revisions will be permitted. **The pursuit of Honors in no way guarantees that the student will receive departmental Honors. This decision will be made independently at the completion of the Honors project.**

4. During the course of the thesis work, it is the responsibility of the research advisor to alert the department to any problems that arise in the research project.

5. At the end of the project, drafts of the Honors thesis are to be submitted to each department member no less than one week before the presentation and defense typically held during the Reading Day of spring semester finals week. The written thesis should conform to the style set forth below.

6. The student will give a public 30-minute presentation of the research, to be attended by all Chemistry faculty. All members of the Dickinson community and friends and family of the student are welcome to attend. The presentation will be followed by a private defense in front of the Chemistry faculty. The presentation/oral defense will be done on the Reading Day of the exam period or a date agreed upon between the Department and the student.

7. Based on the quality of the research reported and the quality of the written thesis, oral presentation, and oral defense, the faculty will make a decision on whether to award Honors.

8. In cases of early graduation, due dates are relative to the student's final semester. Other instances of early pursuit of Honors without early graduation are not typical but may be considered on a case-by-case basis. There must be a clear and compelling reason for pursuing Honors early. Examples may include a faculty advisor going on sabbatical, off-campus study, or not continuing research in the final semester. Students must petition the department for such exceptions with

sufficient time to allow for full consideration of a proposal and thesis as described herein.

Use of generative AI tools in Honors work

The use of generative AI tools is generally not permitted in any part of the development or writing of the proposal for Honors research and the Honors thesis. In cases where generative AI may have a legitimate purpose in the Honors research or production of the thesis or defense presentation, the prospective candidate should outline specific proposed uses of generative AI in the proposal document. Upon review by the department, permission for specific uses of AI may be granted; however, prospective candidates should be aware that all written submissions and generation of ideas must be candidate's own, and broad requests are likely to be denied. This policy is in place for two main reasons:

- Honors designation reflects the candidate's critical engagement with the thesis topic and intellectual ownership of the research. Use of generative AI calls into question the candidate's role in the scholarly process and may also deny the candidate the opportunity to engage with their work deeply in a way that promotes their growth as an independent scientific researcher.
- Generative AI is not broadly accepted in scientific research and publishing, in part, because generative AI writing outputs often create text which plagiarizes the work of others and/or does not accurately refer to that work. These errors have significant legal implications as well as moral; therefore, it is imperative that all writing is the candidate's own. Additionally, providing research materials to AI platforms opens the candidate, advisor, and College up to theft of intellectual property, since the material may be used to inform further AI models.

Format Specifications for Honors Theses can be found on the Archives homepage or https://archives.dickinson.edu/

Timeline and Tasks for Pursuit of Honors in the Chemistry Major

DATE	STUDENT	ADVISOR	DEPARTMENT
ABOUT SECOND SEMESTER - JUNIOR YEAR	Student approaches advisor about pursuing Honors	Advisor approaches dept about student eligibility	Department reviews student records for eligibility
LAST DAY OF CLASSES OF FALL SEMESTER*	Student provides advisor with a proposal and performs revisions as needed	Advisor provides feedback to student on the proposal and assists with crafting a petition if Chemistry GPA is below requirements	
FIRST WEEK OF SPRING SEMESTER		Advisor distributes proposal (and petition if necessary) to the department by first Friday of spring semester	
NEXT DEPARTMENT MEETING			Department considers proposal at a department meeting on the second Friday of the spring semester.
BY THIRD WEEK OF SEMESTER		Advisor notifies student of the department's decision. Revisions may be requested by the department that	

		are conditional for acceptance.	
MINIMUM OF THREE WEEKS PRIOR TO PRESENTATION	Student submits a draft of thesis to advisor	Advisor provides feedback to student on thesis	
ONE WEEK PRIOR TO PRESENTATION		**Advisor** submits thesis to each department member	
PRIOR TO PRESENTATION/ DEFENSE	Student prepares presentation and practices with advisor	Advisor reviews public presentation with student and provides feedback	
READING DAY DURING FINALS WEEK	Publicly presents research to a lay scientific audience and department	The advisor introduces the student. They refrain from answering questions directed toward the student	Department makes a final determination on honors based on success in all three areas (Written thesis, oral presentation, and defense). Department provides requests for revision as necessary that may be conditional for acceptance.
BY NOON WEDNESDAY BEFORE GRADUATION (SENIOR GRADES DUE DATE)	Submits final version of thesis to the library archives, having made revisions, if requested.	Informs Registrar/informs department chair to confirm with Registrar that student has/has	

	not met criteria for Honors

***Or upon a mutually agreed upon date decided by the department.**

Proposal Guidelines

The main purpose of the Honors proposal is to allow the faculty, who will later be evaluating several aspects of the Honors project, to learn enough about the project to determine whether it has the potential to yield results which enable the student investigator to become a candidate for graduating with Honors in chemistry. **This document is meant to make the case that the project should be considered for Honors in chemistry. It is not just a proposal for future work, although experiments not yet completed may be described.**

The Honors proposal should be understandable to a scientifically literate reader; that is, it needs to be informative to chemists in general and not just those in the field of the proposed work.

The proposal should contain the following, and should be as concise as possible, limited to 5 pages including figures:

- Title
- Research Advisor
- Brief synopsis of time frame of project (i.e., summer or semesters spent/to be spent on the project)

Although the format and organization of the proposal may vary, the following must be included:

1. Objectives/goals for the period of the proposed work
2. Relation to longer-term goals of the research advisor's project
3. Relation to the present state of knowledge in the field (i.e., background information)
4. General plan of work, including the broad design of activities (to be) undertaken and an adequate description of experimental procedures. Any collaboration should be noted (e.g., samples or data obtained from others, work done by other student researchers)
5. Results and data obtained to date should be included. While all results/data are not necessary to include and may be added in the final report, sufficient progress on the

project should be demonstrated such that the student's work represents meaningful progress to the project goals.

6. Expected significance and data interpretation. Although students' projects at this point will be of varying degrees of completion, it is essential to discuss state of the student work in pursuit of the overall project goals. Students should discuss data already obtained, and students should articulate what further results are needed or desired in the remaining semester. For example: "Chromatographic results show x; however, we still need to obtain spectroscopic data to support the hypothesis;" or "If the spectrum shows x and y, then we can conclude that z is happening. This in turn means that…".

Preparing for the defense

The defense with the Chemistry Faculty allows the Honors candidate to stand as an expert in their work. Faculty routinely ask questions directly related to the decisions regarding experimental design, data analysis, and interpretation of results. The defense often draws out what and how the student thinks about their work in the context of failed experiments, the broader field, or future applications or lines of inquiry. Students may also expect to receive questions related to fundamental aspects of their project that intersect with their chemistry coursework. For example, reaction mechanisms, instrument function, biochemical pathways, and/or kinetics considerations may be relevant to the work presented and queried by faculty. Sometimes there is no definitive answer to a question, and the faculty seek to evaluate the student's thoughtful response in the midst of uncertainty.

The advisor should help the student prepare for the defense. During the defense, the advisor should refrain from answering questions or otherwise assisting the student. The advisor may answer questions directed at them by other faculty. The advisor does not typically ask questions of the student during the defense but may do so rarely to aid communication between the student and other faculty who are less familiar with the work presented.