

BIOLOGY HONORS PROGRAM

Detailed Information, Timeline, Procedures and Guidelines

Departmental Honors in Biology is awarded to students who have successfully completed a significant record of primary scholarship in Biology. The Honors thesis is a written product based on research conducted in the field and/or laboratory by the student, usually under the mentorship of a Macalester faculty member. The formative work can be accomplished during the academic year and/or during the summer. Successful completion of an Honors project fulfills the senior capstone requirement.

Students pursuing Departmental Honors must make a significant and sustained commitment of time and energy throughout their senior year, and typically embark on their project no later than the summer between their junior and senior years. During this interval the student will develop significant research questions and testable hypotheses, review previous literature, conduct the research and data collection, analyze the data, write the thesis, prepare and present an hour-long public seminar on the thesis topic, and defend the thesis to their Honors committee. Those interested in pursuing departmental Honors are encouraged to contact a biology faculty member and/or the department chair during the junior year (no later than the summer between junior and senior years).

Who should pursue an Honors thesis? There are no GPA requirements to pursue Honors in Biology. Students should bear in mind the substantial workload involved in completing an Honors project, and work with their academic and Honors advisors to ensure they can stay on track to satisfy graduation and program requirements. Students should consider pursuing departmental Honors only if they have a very strong interest in their research topic and are willing to organize their senior year around the demands of the Honors work. Honors thesis research is most beneficial to students who hope to attend a research-based graduate program.

An overview of the Honors Thesis Timeline, specific eligibility criteria, departmental procedures, and formatting guidelines are described in more depth below.

The Honors Timeline

By End of Fall Semester Junior Year: Students should contact a faculty mentor to inquire about the possibilities for research in their lab or field program. This early timing allows plenty of lead time for applying for summer funding if needed. If your planned work is with an off-campus research mentor, please contact the Department Chair, and see below.

Summer Before Senior Year: Most Honors students do research with their mentor in the summer before senior year (and often earlier as well). During this time most students complete the background research for the Honors Thesis, and develop the components required for their Honors Application.

If you are working with an off-campus principal investigator and would like to use this research experience as the basis for your honors thesis, you must get approval from this off campus mentor and work with them to develop your honors application materials. They must agree to continue to supervise your work, including providing needed lab equipment, data analysis tools, editorial support, etc. You must also reach out to a suitable on-campus faculty mentor who will sponsor an Honors Independent Study and serve as your on-campus Honors advisor and chair of your honors committee.

Beginning of Senior Year (September for May graduates; January for December graduates): Honors Applications Due.

Senior Year: Honors students must register for a 4-credit Honors Independent Study in order to make time for continued research, data analysis, and writing. Students must identify their Honors thesis committee in consultation with the on-campus Honors advisor early in the senior year.

January of Senior Year (Summer for December graduates): Some students may need to register for a 2-credit independent study over January Break in order to make time for continued research, data analysis, and writing. You should consult with your Honors advisor to determine whether this is advisable.

Last week of January in the senior year (August for December graduates): Submit a first draft of the honors thesis. Working versions of the introduction, methods/materials, and results should be included. Final figures, tables, discussion and conclusions will very likely still be in progress at this point. Students must also provide a brief progress report and plan for completion to their Honors Committee and the Department Chair for approval. Only those students whose drafts and progress reports are approved will be permitted to proceed in the department Honors program. For those students who decide not to continue with Honors, their completed work can be modified to satisfy the senior capstone paper requirement.

End of Senior Year (April for May graduates; December for December graduates): Final draft of the senior thesis is due. Honors thesis presentation and defense occur, revision of final thesis and submission of final draft. Public presentation during Biology Senior Capstone Symposium occurs.

Eligibility Criteria & Departmental Procedures

Prerequisite Coursework. Only declared Biology majors are eligible to pursue Honors in Biology. The nature of the prerequisite coursework will vary depending upon the nature of the proposed Honors project. Adequate preparation must be demonstrated in relevant areas both within Biology and in supporting coursework (e.g., in statistics, chemistry, geology, biochemistry).

Honors Advisor. Most Honors students complete on-campus research with a Macalester Biology department faculty member, who will serve as the Honors advisor and the chair of the Honors Committee. If you plan to write an honors thesis stemming from an off-campus research experience, you will still identify an on-campus faculty member who will agree to serve in these roles, to sponsor your Honors Independent Study, and to help you navigate the Macalester-specific deadlines. Your off-campus research mentor must agree to allow you to use your data, and continue to supervise your research throughout the year-long honors thesis process, including allowing you access to necessary equipment, data analysis tools, etc.

Honors Application Process. Students must submit a Departmental Honors Application to the Biology Department Chair no later than the first Friday of the Fall Semester of the applicant's senior year. If a student plans to graduate with Honors as a December graduate, the Honors Application is still due the first Friday of the Fall Semester, but in the year *before* planned graduation.

The application must include an explicit thesis question, along with clearly articulated, testable hypotheses. Students must also include a detailed, annotated bibliography of the primary literature related to the thesis topic that is formatted for a scientific journal appropriate to the research (a minimum of 30 references), as well as a brief, but thorough description of the proposed methods for data collection and analysis (~500 - 1000 words). Students must provide a tentative schedule for completion of the project.

Please attach a current transcript that highlights completed coursework foundational to the proposed research.

Please note: if you are working with an off-campus research mentor, the honors application must include a letter from your off-campus Principal Investigator on institutional letterhead in which they agree to continue to mentor your work through completion of your honors thesis, allow you to write the honors thesis using data collected in their lab, and provide the necessary equipment, data analysis tools, etc. to bring your thesis to fruition.

In addition, students must identify two members of the Biology Department who will serve on their thesis committee: their Honors advisor and one additional committee member.

Both the student and the biology faculty member serving as the student's Honors adviser should sign the application.

Applications will be reviewed by the Department Chair and the non-advisor member of the applicant's thesis committee. Students will be notified of the success of their application before the add/drop deadline.

Independent Study Requirements. Honors students are required to register for a 4-credit Honors Independent Study (Bio 644) during the senior year. May graduates must register for BIOL 644 during the fall semester, while December graduates must register for BIOL 644 during the spring semester. Students may substitute a "Research in" class for BIOL 644 if they are working on their Honors research in the class. Unless most of the research and writing is completed before the start of their final semester, Honors students are strongly encouraged to take just three classes during their last semester. If students need a full course load to meet graduation requirements, they're encouraged to enroll in an Independent Study as the fourth course. BIOL 644 may count towards the Biology Major as an upper-level biology course with lab if the Honors student is conducting significant data collection or analysis during the semester in which the Independent Study is taken; this decision will be made by the Chair of the Department in consultation with the Honors student's on-campus Honors advisor.

Students are permitted to register for no more than two 4-credit independent study courses (in addition to the optional 2 credit January independent) to work on their Honors project. Note: only one 4 credit-independent study, "Research In" course, or internship may count toward the Biology major requirements.

Honors students may also need to register for a two-credit January Independent Study during their senior year. The purpose of this January Independent Study is dedicated time to focus on research and/or writing. Usually, students complete this independent work on campus. However, in certain cases, Honors research and/or writing may be better accomplished off campus during January, e.g., in a particular lab or field site.

The Honors Committee. The Honors thesis is read by a committee of three members. These members typically include the Honors advisor, one other member of the Biology Department, and an individual from outside the department who is an expert on the topic. The outside committee member may be from another Macalester department, or may be from another institution. Students pursuing an interdisciplinary topic for their Honors research should identify a faculty member from the non-biological discipline who can serve as an Honors Committee Member or a Co-Advisor of the Honors Thesis project. If the thesis results from an off-campus research experience, the off-campus research advisor serves as the outside committee member.

The Thesis. The Honors Thesis should be written as a research manuscript formatted for a scientific journal appropriate to the field of study (the Honors advisor will provide suggestions). The student should demonstrate a thorough understanding of the major ideas, findings, and theories of the biological field that provides the context for the student's own study. It is expected that the student will clearly describe how his/her specific study relates to the larger questions and issues confronting the broader research discipline. The thesis must conform to the organization, formatting, type-size, and margin-width guidelines detailed below.

Biology Honors Thesis Common Formatting Guidelines. The final thesis document should have its contents arranged in the following order:

- Title Page (listing the thesis title, student's name, the words "An Honors Thesis Submitted to the Biology Department at Macalester College, Saint Paul, Minnesota, USA", and the date (day, month, year) of completion.)
- Abstract (on its own page)
- Table of Contents
- A preface (if desired)
- Acknowledgements
- The Thesis Narrative (adhering to appropriate journal guidelines: Introduction, Methods and Materials, Results, Discussion, Conclusions & Future Work, etc.)
- Literature Cited
- Tables, each on a separate page with a detailed caption and labeled (Table X).
- Figure Captions
- Figures, each on a separate page and labeled (Figure X).
- Appendices (if needed) - these may be the equivalent of Supplemental Online Materials, including additional data tables, figures, etc.

All typescript pages, including references, figure captions, tables, and appendices, must be double-spaced. Font should be Times New Roman (12 point) (with exceptions for labels within figures). All pages must be numbered. Format for headings and subheadings, in text citations, and citation format must also follow journal guidelines.

Margins should be one inch (top, bottom, & right) and 1.5 inches (left).

The Honors Presentation. Honors students will present a public seminar on their Honors research in the final semester of their senior year, typically consisting of a 45-minute presentation plus 15 minutes of discussion with the assembled audience. In addition, Honors students are encouraged to present their findings at an appropriate professional meeting, and/or the [Winchell Symposium](#) (in April), and/or at the Biology Department Senior Capstone Symposium (a 10-12 minute talk aimed at a general audience).

The Honors Defense. Immediately following the Honors Presentation, the Honors Committee meets in a closed-door session with the student for about an hour. During this thesis defense, committee members question the student about the research, and detail required revisions. Following the meeting with the student, the committee will adjourn to decide as a group whether the thesis merits the Honors designation. Any required revisions must be completed prior to submission of the final thesis.

Please note: We recognize that plans, goals, and interests shift over time. Students may opt out of the Honors program at any time, without penalty. Macalester's college-wide requirements and deadlines for the Honors program are detailed [here](#).