

# DEPARTMENT OF BIOLOGY HONORS PROGRAM

## Information & Guidelines

### OBJECTIVES

The primary objective of the Department of Biology Honors Program is to encourage and recognize superior scholarship by providing an opportunity for interested, capable and energetic undergraduate students to engage in intensive, independent study that results in an Honor's Thesis. The research project is conducted under the close supervision of a faculty mentor.

### ADMISSION

- 1. Undergraduates are eligible to enter the Biology Department Honors Program upon attaining sophomore standing unless a special exception is granted by the Program Director.** Acceptance into the program is not encouraged after the first semester of the junior year, but may be allowed in certain circumstances by the Program Director.
- 2. Students who have an overall cumulative grade point average of at least 3.0 may be considered for program admission.** Transfer students with equivalent academic records at other accredited institutions are also eligible. Admission will not be based on grades alone, but on some evidence of maturity and interest that suggests they are likely to complete successfully the requirements for graduation with Honors. Students do not have to be Biology majors to participate.
- 3. Students must have identified a faculty mentor and arranged for sponsorship before an application will be reviewed.** The mentor must be a Biology faculty member or a close affiliate of the Biology Department, such as an adjunct faculty member of the Department or a biologist working in a related Department or Institution who can work closely with Biology faculty. If the outside mentor has not worked with the Biology Honors Program before, it will be necessary for the student to have a Co-mentor in the Biology Department who will remain in close contact with the student's research and the outside mentor and sponsor the student's Honors research credits. If a student is not certain whether or not a particular faculty member qualifies as a Biology Honors Program mentor, the student should contact the Director of the Biology Honors Program. If a student is not certain about who they want to work with, they should consult with faculty in their area of interest and consider working in the laboratory of a potential mentor by registering for non-honors research (e.g., BSCI 279 or BSCI 399). To help identify prospective mentors, a student also may wish to peruse the websites of faculty members in the Biology Department and in biology-related Departments. In addition, students may check with the Biology Undergraduate Office (room 2227 BPS) or with the Director of the Biology Honors Program for descriptions of the research interests of all Biology faculty.

**4. Interested students ideally should submit an application to the Director of the Honors Program prior to the semester the student wishes to enter the program, although applications are considered on a rolling basis.** The selection of students for the Honors Program is the responsibility of the Program Director, who will consider the past performance of the student as well as the student's interest and prospects for success in the program. Applications may be obtained from the Biology Undergraduate Office (BPS room 2227), from the Director of the Biology Honors Program, or from the Department of Biology website.

## **PLAN OF STUDY/DESCRIPTION OF PROGRAM**

The Biology Department's Honors Program is highly research oriented. The objective of the research is to provide Honors students with an opportunity to gain an appreciation for and actively participate in the research process, working closely with the faculty mentor and members of their lab. This is viewed as including:

- 1. Identifying a problem.** The problem may originate with the student's mentor, but, as the student gains experience, the problem should evolve into one that has aspects contributed by the student.
- 2. Appreciating the background to the problem.** Background may be acquired through reading relevant literature and discussion with the mentor.
- 3. Developing a Hypothesis.** The student and mentor should develop a statement summarizing their understanding of the system under study in a way that permits testing the idea that has been developed. Either confirmation or rejection of the hypothesis should yield an interesting result.
- 4. Learning the methods and acquiring the data.** The student and mentor should develop suitable methods of analysis or experimentation that appear appropriate to yield the data necessary for testing the hypothesis. Data are collected by the student and the results are recorded.
- 5. Analyzing and interpreting data.** Graphic and statistical analyses of the data should be completed in a manner appropriate for testing the stated hypothesis. The student then interprets the data and results from the analyses, drawing conclusions and perhaps suggesting alternative hypotheses.

Students may receive Honors in more than one Department, but the program requirements of both Departments must be met, the student must have prior approval from the Biology Program Director, and theses completed for each Honors Program must be independent (i.e., the same project may not be used to meet the requirements of both Honors Programs).

A total of three credit hours of Biology Honors Research (BSCI 399H) will apply toward the Biological Sciences major (but will not count as a lab course). The remaining credits (up to 8 hours for BSCI 399H and up to 4 hours for BSCI 398H) contribute toward general electives for graduation.

## REQUIREMENTS OF THE PROGRAM

- 1. Enrollment in Honors Seminar (BSCI 398H) each semester.** This is a 1-hour weekly seminar in which Honors students meet to hear other speakers; discuss student progress, proposals, theses, and timelines; make research presentations to peers; and engage in other potential activities to become integrated into the Biology Honors group. If the student has difficulty registering, he/she can contact the Biology Undergraduate Office to assure that the electronic barrier to enrollment has been removed.
- 2. Enrollment in Honors Biology Research (BSCI 399H),** usually for 1-2 credits, each semester is required each semester that the student is carrying out some aspect of the research process described above. As a rule of thumb, 3-4 hours of research time/week = 1 credit hour. Biology Faculty or Affiliated Faculty will have a BSCI 399H Section number under which students enroll. If the primary faculty mentor is not a member of the Biology Faculty or does not have a BSCI 399H Section number, then the student should enroll under the section number of the faculty member within the Biology Department who is co-mentor (unless the primary faculty mentor outside the Department specifically requests an alternative arrangement, in which case this can be discussed). If the student has difficulty registering, he/she can contact the Biology Undergraduate Office to assure that the electronic barrier to enrollment has been removed.
- 3. A Thesis Research Proposal that has been approved, signed and dated by the mentor(s) must be submitted to the Director of the Honors Program. This is due at the end of the second semester in which the student has enrolled in the program unless the student entered the program in their sophomore year, in which case their proposal is due at the end of their junior year. It may be necessary to submit the Proposal earlier than the second semester after entering the program if the student has entered the Program later than usual.** This proposal should be developed in consultation with the mentor(s) and typically includes (1) a background section that highlights relevant literature and establishes the context and significance of the proposed work, (2) a clearly stated hypothesis or set of hypotheses, (3) the methodology for acquiring and analyzing the data, (4) the expected or possible results, (5) a discussion section that includes interpretation and significance of the possible results, regardless of whether the hypotheses are supported or rejected, and (6) a literature cited section.
- 4. An Honors Thesis must be completed for review by a Faculty Committee consisting of the mentor and at least two other faculty members.** The committee is selected by the student in consultation with the mentor and the Director of the Biology Honors Program, and needs to be approved in writing by the Director. The thesis should be written in standard thesis format or in a format that would be submitted to a scientific journal. **The Faculty Committee must approve the Thesis. A copy of the final version of the Thesis is due to the Director of the Biology Honors Program no later than 2 weeks prior to the registrar's deadline** (exact dates will be available from the Director each semester but are typically early-November and early-April) in order for the student's name to be printed on the College Commencement Program, **or by the time of Commencement** in order for the student to receive "Honors/High Honors in Biology" on their transcript and diploma.

**5. An Oral Defense of the Honors Thesis should be completed prior to submission of the final version of the Honors Thesis to the Honors Program Director. The date of the Thesis Defense and associated information should be provided to the Director of the Biology Honors Program at least 2 weeks prior to the defense so that it can be announced publicly.**

The first part of the Defense will consist of a short oral presentation (20-30 minutes), which will have been announced to the Department of Biology and is available to the public as well as the Faculty Reviewing Committee. The presentation will introduce the audience to the problem and the objectives of the research, provide key results, and interpret the significance of the work. The presentation will be followed by questions from the audience on the research topic and broader relevant areas. After departure of non-committee members in the audience, the Faculty Committee will remain to further examine the student's knowledge of the thesis topic. **The Faculty Committee should be given the Thesis at least 2 weeks prior to the date of the oral defense.** The Faculty Committee evaluates the student's performance in the Defense, the student's written Thesis, and the student's overall level of research performance, including comprehension of the subject matter. An Honors Thesis Defense Form must be filled out and signed by the student's Faculty Committee at the time of the Oral Defense. If the student successfully passes the Oral Defense, the examiners must indicate whether the student graduates with "Honors in Biology" or "High Honors in Biology". In general, the "High Honors" category is reserved for exceptional students who have presented research at national meetings or authored or co-authored a paper that has been accepted or is being submitted for publication.

The mentor must inform the Honor's Program Director of the outcome of the defense and the student's graduation status (did not successfully pass the defense, passed with "Honors" or "High Honors") no later than 2 weeks prior to the registrar's deadline (exact dates will be available from the Director each semester but typically are early-November and early-April) in order for the student's name to be included as graduating with "Honors in Biology" or "High Honors in Biology" on the College Commencement Program, **or by Commencement** in order for the student to receive the Honors/High Honors designation on their transcript and diploma. For example, the student's diploma will read: Bachelor of Science, College of Computer, Mathematical and Natural Sciences, "Honors in Biology" or "High Honors in Biology."

### **Privileges for Honors Students**

1. Honors students who are making demonstrable progress in their research are eligible to apply for scholarships that may be available from the General Honors Program or from the College of Life Sciences (e.g., the Howard Hughes Medical Institute Grant).
2. They may be granted the right to use academic facilities ordinarily available only to graduate students or assistants.
3. They may take, with permission of the instructor and the Department, graduate courses and receive undergraduate credit for them.
4. They are invited to attend weekly seminar series, such as:

Behavior, Ecology, Evolution, & Systematics (BEES) - Monday, 12:00 – 1:00pm, BRB 1101

Molecular and Cell Biology (MOCB): Wednesday, 12:00 – 1:00pm, BRB 1101

Computational Biology, Bioinformatics, and Genomics (CBBG): Wednesday, 12:00 – 1:00pm, BRB 1101

Neuroscience and Cognitive Science (NACS) - Friday, 12:00 – 1:00pm, BRB 1101

Entomology (ENTM) – Friday, 12:00 – 1:00 pm, PLS 1130

5. They may take any University Honors Program course (including many 300-level courses that may fulfill advanced studies requirements) or any Honors versions of courses given in any department (departmental approval required in some cases).

### **Evaluation**

The performance of Honors students will be evaluated each semester, with progress assessed on the basis of a) a written progress report from the student, b) a written evaluation by the mentor, and c) participation in the weekly Honor's seminar. The students must also maintain the minimum grade point average each semester.

### **Withdrawal from the Program**

Honors students may be advised or required to withdraw from the program if his/her course achievement and progress in the program indicate to the Program Director and mentor that withdrawal is desirable. Ordinarily a student will be advised or required to withdraw if his/her cumulative grade point average is below 3.0. If the student withdraws before defending an Honors Thesis, the credits accumulated from the participation in Honors Research BSCI 399H will not be counted toward satisfying the requirements for a degree in Biological Sciences. Up to half of the credits accumulated from participation in the Honors Seminar, BSCI 398H, may be counted toward satisfying the requirements for the major.