

Integrated Science Honors Guidelines

Revised and adopted 10/18/07

In order to receive the Integrated Science degree with honors a student must complete ISP coursework with distinction and carry out independent research under the supervision of a faculty member. The honors program is administered by the ISP Committee, which is appointed by the Dean of WCAS. This insures representation from all disciplines studied by an ISP student. The Program Director is the honors coordinator.

I. Invitation to the Honors Program

Students are reminded in their next to last year that they may wish to review the guidelines for honors when they sign up for independent study, and to choose projects that will lead toward meeting the criteria.

In the fall quarter of the student's last year (which may be the third or fourth year in the case of ISP students) the Program Director will inform eligible students that they may consider working toward honors. As most ISP students will graduate with second and sometimes third majors, the student must decide whether to work toward honors in ISP or in another major, since a project may only count in one department. In unusual circumstances, it may be possible to achieve more than one degree with honors, if more than one significant project has been done. Additionally, the student may want to write an interdisciplinary thesis for having carried out a highly significant project that connects two different disciplines. In both cases, he/she must complete the "Statement for Dual or Interdisciplinary Senior Honors Projects" at the beginning of the fall quarter of his/her last year¹.

Because of the rigor of ISP and the fact that all courses taken are honors courses, all students with GPAs of 3.2 and above will be notified of their eligibility for the honors program. The transcripts and reports from independent study advisers will be reviewed for all other students, and those with GPAs above 3.0 will be invited if their work in independent study warrants it. For students who have worked with an adviser prior to their final year, the Program Director will solicit advice on whether the work that has been done or which the student is doing is likely to meet the requirements for an honors project. The student will be informed of the adviser's decision in order to allow the student to modify work on that project or to choose another one with the same adviser or another adviser that would qualify.

There are no special course requirements for honors, except that by graduation, students must have completed at least two quarters of Integrated Science 398² (Undergraduate Research) under the supervision of a single faculty member. This will often be a formal recognition and culmination of a larger effort, including work for which no credit is given and/or work over the summer. Students are cautioned that only rarely is the minimum two quarters of work adequate to do a project worthy of honors.

¹ http://www.wcas.northwestern.edu/advising/procedures_for_two_honors_policy.html

² In certain cases, ISP students may petition to have 399 Independent Study credits from other ISP-related disciplines used in place of Integrated Science 398 to fulfill this requirement. Such a petition must be submitted in writing to the Program Director *prior* to the selection of the thesis topic. If the permission is granted, the 399 credits used cannot be used to qualify for honors in other disciplines.

II. Procedure

1) Choosing an adviser

The student is responsible for seeking out an adviser in his or her area of interest. The Program Director and other faculty may be useful resources in this regard. Once an adviser has been chosen, the student follows the same procedure that is followed for any 398 in ISP, i.e. the student must write a description of the work to be done on a form provided by the program assistant, and the adviser must indicate: 1) the method of evaluation for each quarter of work and 2) the frequency of advising. This form must be signed by the student, the adviser, and the Program Director before the student registers for each unit of Integrated Science 398.

2) Deadlines

The student must submit a title for the project to the Program Director by the end of the first week of winter quarter in the year of graduation. At this time, the name of a second faculty member who has agreed to read the final report and write a letter by the deadline should be submitted. The student's thesis and faculty support/evaluation letters (see below) must be submitted by the due date given by the department, usually around the beginning of May³. The ISP Honors Committee will then meet to determine who should be recommended to the WCAS Committee on Superior Students and Honors.

3) Area of the project

Students may elect to do a research-based project in mathematics, physics, chemistry, biology, astronomy, geology, environmental science, or computer science. Other related areas in the physical and biological sciences may also qualify upon consultation with the Program Director. In some cases where the scientific nature of the project is unclear, a formal petition must be filed and be evaluated by the ISP Committee.

4) Scope of the project

The project chosen should be one in which the student can make an independent intellectual contribution, and which is feasible in a limited amount of time. It is crucial that the student make an independent contribution of some type. All quarters of independent study will not and need not meet this guideline, since it may be necessary to learn techniques and review literature. The project could involve theory only, but in experimental work, the student should be involved in the design and/or analysis. Taking part in only the execution of experiments will usually not meet the criterion of making an intellectual contribution.

Because of the range of possible topics and the widely differing nature of research in fields covered by ISP, it is not easy to provide a uniform definition of projects that would meet the requirements. For example, high energy physicists typically work in large groups where no one person can accomplish a whole project, and systems neurobiologists work individually or in small groups, but with techniques that may be more than an undergraduate can be expected to master. Although it may be possible in some fields for the student to take a project from start to finish and design, execute and analyze the experiments, this is not a requirement. In addition, the project need not result in work of publishable quality, and results that are not definitive are acceptable. None of the following are acceptable as an ISP honors project: simple data collection without analysis, analysis of data with canned programs, becoming proficient at a technique, and reviewing literature. Literature reviews that result in a new

³ To meet this schedule, the student must be prepared to give their faculty adviser and faculty reader a near-finished thesis two weeks before the due date to allow adequate time for the faculty members to read and write the required letters.

synthesis of information or new hypotheses to be tested, however, will generally be acceptable. Computer programming is not acceptable according to WCAS guidelines, but this is interpreted to mean programming of a service nature in which the student follows instructions and commits someone else's idea to code. Writing a program that allows a new type of analysis or a new application is acceptable if the student plays a role in the rationale for or application of the program.

5) Report

The student must prepare a written report of the work accomplished. This paper should be entirely the student's work. It should include a description of the problem being addressed, a background section consisting of a literature survey and enough information to make the subject accessible to any faculty member in the field being studied, methods (if appropriate), results and analysis (including appropriate equations, tables, and graphs), a discussion of the work's significance and shortcomings, a list of references, and acknowledgements to others involved in the work. In writing this paper, the students should be guided by the format suitable for a journal article in the field chosen. It is not acceptable to present a published paper or manuscript intended for publication on which the student is an author, although some sections of such a paper may be used verbatim if the student wrote them originally, and if they are appropriately referenced.

It is strongly recommended that a draft of the report be submitted to the adviser several weeks in advance of the deadline, so that appropriate revisions can be undertaken. The final report must be submitted to the Program Director by the deadline noted above.

6) Letters

The faculty adviser must write a letter on the student's behalf based on a careful examination of the report and knowledge of the project. This letter must describe the work in terms that the entire ISP Committee, which consists of faculty members from Division I departments, can understand, and must provide an evaluation of the project and of the report. It must also describe the student's original contribution and extent of independence. Most importantly, the adviser must explicitly state that he/she finds the student's work to be of high quality. The adviser's letter must be submitted at the same time as the student's final report.

A second letter must also be submitted, written by a faculty reader unconnected with the student's project. The letter must judge the work to be both independent and substantive, but it need not describe the work. The adviser and/or reader may be members of the ISP Committee.

Note: To allow maximum flexibility for the student, and because many students in ISP do independent work well before the final year, units of 398 taken before the final year may be counted toward honors. If the student did not prepare a report on the project at that time, he or she must do so during the final year. The timetable and guidelines for the report are the same as given above.

III. The Award of Honors

Participation in independent study is necessary but not sufficient for honors. The ISP Committee will meet once all materials have been collected and will evaluate each student. A vote will be taken on each one. If the majority of the committee's votes are favorable, the student will be recommended for honors to the WCAS Committee on Superior Students and Honors. If the ISP Committee votes not to recommend the student, the Program Director will write to the student explaining the basis for the decision and giving the student an opportunity to respond in writing. The student's response will be considered by the ISP committee and a new vote will be taken.