

Honors Programs in Physics and in Astronomy

I. Preamble:

Honors programs in physics and in astronomy must take into account the highly developed nature of these disciplines and the fact that new developments are likely to be extensions and ramifications of their present structure. New discoveries and ideas will contribute to the progress of both physics and astronomy only when their relation to the present state of knowledge is made clear. For these reasons we believe that the best preparation that undergraduates majoring in physics and in astronomy can have for independent and creative work later in their careers is the acquisition of a solid background in the physical laws of nature as presently known, together with the knowledge of the manner in which these laws were discovered. Furthermore, since the laws of nature receive their most general, powerful, and elegant form when expressed in mathematical language, an integral part of every physicist's and ever astronomer's background should be mathematics. Therefore, we believe that Honors programs in physics and in astronomy should be judicious combinations of fundamental courses in physics, astronomy and mathematics, together with a thorough independent study culminating in a senior thesis of high quality.

II. Requirements for Entrance into the Honors Programs in Physics and in Astronomy:

- A. Formal application to the program is made at the beginning of the senior year. At the time of application the student and adviser must have formulated a program of investigation. Informal work during the junior year with the thesis adviser is the most effective way of exploring the available possibilities and developing a strong program; preliminary work during the junior year is strongly encouraged.
- B. To qualify for consideration, students should have:
 - (1) Attained a minimum grade point average of 3.0 in all work previously taken for credit and in the departmental Program of Concentration;
 - (2) Exhibited to the Physics and Astronomy Department such other evidence as may be required to indicate a capacity to undertake independent study.

Formal application to the Honors Program includes submission of a paragraph describing the proposed work. This proposal must 1) have a title 2) be signed by the student and the thesis adviser 3) state whether the program is for honors in physics or in astronomy, and 4) provide either a schedule for taking the normally required supporting courses or an alternative plan for dedicating the required effort to the project.

- C. Applications to the Honors program are to be submitted to the departmental Honors and Independent Studies Committee, which will then recommend candidates to the department for admission to the Honors programs. After departmental approval of any candidate, the Honors and Independent Studies Committee will request that the Department Chair notify the Director of Honors Study of the College to formally admit the candidate to the department's Honors program.

III. Role of the Adviser and the Honors and Independent Studies Committee:

- A. Each candidate shall choose an Adviser, with the concurrence of the Honors and Independent Studies Committee, who shall counsel him or her in the design of the candidate's individual plan of studies, supervise his or her progress and regularly report such progress to the Honors and Independent Studies Committee, and, on the fulfillment of all requirements and on the recommendation of the candidate's examination committee, nominate him or her to the Department for Honors in physics, Honors in astronomy, High Honors in physics, or High Honors in astronomy.
- B. The Honors and Independent Studies Committee will be composed of three members, one of whom should be an astronomer, and may be a subcommittee of the Undergraduate Program Committee. The responsibilities of this committee are to: (1) recommend candidates for Honors study in the Department; (2) assist in the choice of the Honors Adviser for any candidate; (3) insure that the candidate's individual plan of study and its progress are satisfactory; (4) assist the Adviser in the selection of the examination committee.

IV. Requirements for Successful Completion of the Honors Programs in Physics and in Astronomy

A. Course Requirements

- (1) Completion of all the requirements for the Program of Concentration (Major) in Physics. Honors candidates may petition the Honors and Independent Studies Committee for exceptions to the course requirements of the Program of Concentration.
- (2) An Honors Thesis must be a significant contribution to scholarship in the field and its preparation requires extensive work on the project selected and evaluation of the significance of the work in the field of study. In order to be sure that adequate time is set aside for this work, completion of an additional 10 hours of work in some combination of Physics 291a or b (Independent Study), Physics 296a or b (Senior Thesis), Astronomy 291a or b (Independent Study), or Astronomy 296a or b (Honors Research and Senior Thesis) is normally required. Since one of the advanced undergraduate or graduate lecture courses may help with this effort, the honors candidate may fulfill up to 3 of the ten hours with any lecture course in physics or astronomy numbered above 251 which helps prepare the student for the thesis work. Advanced course work in other departments can provide essential background in some areas of physics research and honors candidates may petition the Honors and Independent Studies Committee to permit up to 3 hours of independent study, completed by the Honors candidate in another department, to count toward this requirement if the course is related to the thesis topic. The preceding discussion states the rationale and provides guidelines for course work associated with the thesis, but all or part of this ten hour requirement may be waived if the candidate and adviser present a suitable alternative to the Honors and Independent Studies Committee by the start of the senior year.

A. Other Requirements for all Honors candidates:

- (1) Normally, no candidate will be considered eligible for the Honors designation unless he or she has (a) a 3.0 grade point average in all work taken; and (b) maintains a B average, or better, in all courses taken in the Physics and Astronomy Department during those semesters in which the candidate is formally enrolled in one of the departmental Honors Programs
- (2) In the Physics and Astronomy Department each Honors candidate is required to write a senior thesis, in the creation of which he or she shall be required to demonstrate some degree of originality and maturity in the methods of independent investigation, analysis and criticism, and to exhibit skill in its written presentation. (This thesis may consist of one or more papers in the form appropriate for publication in a learned physics or astronomy journal plus appendices expounding details which would not be appropriately included in such publications.) The thesis must be in finished form by the time of the candidate's Honor examination.
- (3) The Honors work will culminate in an oral examination to be taken only once and to be conducted in the final semester of the candidate's senior year by a Committee of Independent Examiners (CIE) who have not participated in the candidate's Honors work. The examination shall be completed by the first day of the regular final examination period of the final semester of the candidate's senior year. One or more examiners from other colleges or universities may be members of the CIE. The CIE shall be appointed by the departmental Honors and Independent Studies Committee with recommendations from the Adviser. The oral examination should be primarily (but not necessarily exclusively) concerned with the thesis and the specific fields of independent work completed by the candidate. By majority vote the CIE shall decide whether to recommend that the Adviser nominate the candidate to the department for Honors, High Honors, or no Honors at all, in physics or in astronomy. The Department, then by majority vote of those present at the meeting to which all the departmental staff at the level of instructor or above (including the candidate's Adviser) have been invited, shall decide whether to elect the candidate to Honors or High Honors in physics or in astronomy. The candidate should be informed promptly of the results of the examination and the decision of the Department.

IV. Regulations Concerning Unsuccessful Candidates:

- A. On the recommendation of the Adviser, or the Honors and Independent Studies Committee, students may be dropped from the program for failure to meet proper standards of performance.

- B. Students who complete the Honors program without being awarded the designation of Honors will be permitted to graduate if their total work satisfies the departmental requirements for the Program of Concentration.

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2nd Revision - September 1988

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