

Ph.D. Goals and Assessment Methods

Acquire and demonstrate advanced knowledge in foundational areas of physics and astronomy, and a mastery of their selected subfield.

- PhD candidacy examination administered by student's committee.
 - The candidacy exam is distinct from the student's Research Progress and Proposal Report, and is used to assess knowledge in the sub-field of the student's expected PhD research.
 - The body of knowledge that a student is expected to know is determined by faculty in that sub-field. Topics must be openly available in advance and cannot be changed too close to exam. This process should help maintain a balanced standard across the sub-disciplines within the department. A more detailed discussion of this is appended below
 - The department's "outside area" delegate on this committee writes a note documenting which of the subfield knowledge topics were addressed and briefly noting how the student responded to the questions on those topics. This information will be used to assess whether all elements of the first years of the graduate program are achieving the stated goal.
- Members of a student's committee meet with the student at least annually to assess progress.
 - When each student affiliates with a research adviser, an advisory committee of 3 departmental faculty will be formed.
 - The chair of this committee is the research adviser, the second member is a faculty member agreed upon by the student and their adviser generally with expertise in the same research area as the student's work, and the third member of the committee is appointed by the chair of the Graduate Program Committee.
 - This advisory committee monitors the progress of the student in all aspects of their career in the department. The student will meet with their committee at least once a year and a written assessment of the student's progress will be placed in the student's file.
 - This committee is meant to be a resource for the student and the student can meet with *any* member of this committee whenever an issue arises.
- The content we expect our students to learn through coursework is detailed in the syllabi of the courses offered.
 - Detailed syllabi for all courses are posted online on the department web site. These syllabi contain more detail than available in the general announcements to document the content we expect the students to learn.
 - The Graduate Program Committee reviews degree requirements, course offerings, and syllabi on (at least) a five-year cycle to ensure the content expected of our students is suitable to meet the above goal.
 - The Graduate Program Committee reviews consistency between final exam (or other appropriate work) and course content, as listed in course syllabus, on a five year cycle

- Final exams, or other sample material, from all courses are archived annually, together with average student grades for each question.
 - The Graduate Program Committee reviews sample course work from each course on a five year cycle ensuring that students are learning the content.

Develop the skills necessary to conduct independent research in physics and astronomy and become leaders in their chosen careers.

- Public defense of thesis before a faculty committee, including at least one member from outside the department.
- Students are encouraged to:
 - Author or co-author publications in refereed journals, make presentations at national or international meetings (posters/oral talks)
 - Apply for fellowships etc.
 - Make collaborative visits to collaborator institutions when appropriate
- A written list of such accomplishments should be given to the Ph.D. thesis committee.

Develop the ability to identify, formulate, and solve challenging scientific and technical problems as encountered in physics and astronomy.

- The Graduate Program Committee reviews sample work from various courses on a several year cycle.

Become proficient in reading the scientific literature and in oral and written communication of scientific results.

- Monitor professional placements and alumni successes.
- Public defense of PhD thesis before a faculty committee including at least one member outside the department.
- Drafts of PhD thesis reviewed by faculty.
- Practice presentations prior to conferences before faculty and peers.

Make an original and significant contribution to knowledge in their discipline.

Each student is required to complete a Ph.D. thesis.