



Department of Astronomy
Harvard University

Study Plan for First Year Graduate Students

Your Name: _____ Year: _____

Your Advisor's Name: _____

The purpose of this study plan is to aid you in planning your coursework for the first two years and to allow the department to assess your academic needs. The plan should be discussed with and approved by your Academic Advisor before September 10, when all advisors are required to log in and approve your Study Card for fall semester. It may be helpful to discuss your options with other graduate students or your mentor. The numbered questions contained here should be answered carefully, as they are the basis upon which your Advisor may make recommendations to you.

Your Study Plan is not strictly binding, but if you decide to change course selection in the Spring semester, you should discuss this with your Advisor before registration.

1. Please identify a primary field of interest (this will be added to your profile on the Department website):

General Background Requirements

The Committee on Academic Studies reviews the transcripts you submitted with your application at its first meeting each October. If you did not submit your final undergraduate transcript to Admissions, please bring a copy to Robb in the Astronomy office.

Many students admitted to the Harvard Astronomy graduate program were physics majors in college, and it is difficult to assess their backgrounds in classical aspects of astronomy, especially their knowledge of astronomical terminology. Each first year will take an inventory exam in November to assist the committee in ensuring that you have sufficient understanding of the broad field generally. This inventory will cover the basic concepts/core of Astronomy and Astrophysics that students coming from Physics or other disciplines might not know (magnitude and coordinate systems, flux definitions, elementary galactic structure, cosmological principles, etc.).

More information is available here:

<http://astronomy.fas.harvard.edu/placement-examination>

2. Self-Assessment

A note regarding sufficient preparation to begin research work can be found here:

<http://astronomy.fas.harvard.edu/physics-background>

In what areas do you think you may have deficiencies?

How would you propose to remedy such deficiencies?

3. Computer Programming

Although not a formal requirement, every student is expected to be familiar with computer programming, at least on an elementary level. Typical minimum level of proficiency is an ability to write a simple Python, IDL, MATLAB, FORTRAN or C program for performing arithmetic operations, sorting data or integrating simple equations.

Do you feel that you are familiar with programming at that level?

What is your programming experience so far?

If you feel that you need to learn programming, either on your own or by taking formal courses, how do you plan to accomplish this?

Course and Teaching Requirements

The course requirements for your PhD program are described below and online here:

<http://astronomy.fas.harvard.edu/astrocourses>

Candidates for a PhD in Astronomy and Astrophysics should complete one core course in astronomy, at least five electives in astronomy, at least one graduate physics course, and should participate every year in Journal Club. Details follow.

A. All students should complete and obtain a satisfactory grade (A or B) in:

- Astronomy 200 (formerly Astronomy 150): Radiative Astrophysics

B. In addition, students are expected to obtain a satisfactory grade (A or B) in at least five of the following graduate level electives offered by the Astronomy department:

- Astronomy 151: Astrophysical Fluid Dynamics
- Astronomy 189: Exoplanet Systems
- Astronomy 193: Noise and Data Analysis in Astrophysics
- Astronomy 201a: Stellar and Planetary Astrophysics
- Astronomy 201b: Interstellar Medium and Star Formation
- Astronomy 202a: Galaxies and Dynamics
- Astronomy 202b: Cosmology
- Astronomy 215hf: Topics in Contemporary Astrophysics
- Astronomy 218: Radio Astronomy
- Astronomy 219: High Energy Astrophysics
- Astronomy 231: Optics for Astronomers
- Astronomy 251: Quantum Mechanics for Astrophysics
- Astronomy 253: Plasma Astrophysics

One of the five astronomy electives may be replaced with a course of equivalent intellectual substance in applied mathematics, computer science, physics or planetary sciences at the discretion of the DGS. It is possible that you already have a sufficient preparation in the fields covered by those courses on the basis of your own study or courses taken elsewhere, and can satisfy the requirement by taking an oral examination with the instructor responsible for the course. You are strongly urged to make any arrangements before the start of the term in which such courses are offered. Please note that undergraduate level courses offered elsewhere seldom provide adequate preparation. List any courses that you plan to satisfy through oral exams, and note if you have made any arrangements to that effect.

C. One graduate level elective in physics or other related field. Traditionally, this elective is a graduate-level physics course such as Quantum Mechanics or General Relativity. One or both of these courses are still encouraged for students pursuing research theoretical astrophysics. Other graduate-level courses covering topics such as data

analysis, computer science, or planetary sciences can be substituted for a physics course provided approval is requested from the CAS.

D. Every graduate student is required to register for and participate in Journal Club (Astronomy 301hf) each year.

E. All students, independent of their financial support, must teach for at least two semesters as part of their educational requirements. First year students may **not** serve as TF's, unless they receive permission from their advisor. Students with an NSF scholarship are not allowed to teach during their first year, per NSF rules.

4. Course and Teaching Plan

Please check or list below the courses you intend to take during your first two years (i.e., four semesters). Please also check teaching and research time (Astro 300) as appropriate. You can write in courses from other departments. A full-time schedule generally is four selections per semester plus Astro 301 (Journal Club).

2015 Fall	2016 Spring	2016 Fall	2017 Spring
X Astro 200	<input type="checkbox"/> Astro 151	<input type="checkbox"/> Astro 251	<input type="checkbox"/> Astro 189
<input type="checkbox"/> Astro 202a	<input type="checkbox"/> Astro 202b	<input type="checkbox"/> Astro 201a	<input type="checkbox"/> Astro 201b
<input type="checkbox"/> Astro 215h	<input type="checkbox"/> Astro 215h		<input type="checkbox"/> Astro 193
<input type="checkbox"/> Astro 218	<input type="checkbox"/> Astro 219		<input type="checkbox"/> Astro 231
	<input type="checkbox"/> Astro 253		
X Astro 301h	X Astro 301h	X Astro 301h	X Astro 301h
		<input type="checkbox"/> Teach	<input type="checkbox"/> Teach
<input type="checkbox"/> Astro 300	<input type="checkbox"/> Astro 300	<input type="checkbox"/> Astro 300	<input type="checkbox"/> Astro 300
<input type="checkbox"/> Astro 300	<input type="checkbox"/> Astro 300	<input type="checkbox"/> Astro 300	<input type="checkbox"/> Astro 300

5. Research Project

Normally, students look for a research advisor and research project during their first semester, and begin work on the project at the start of their second semester. Officially, a student must decide on the advisor by the end of the fall semester and should forward the name of the advisor to the Department Office. The selected research advisor then becomes also the student's academic advisor. More information about research projects is available here: <http://astronomy.fas.harvard.edu/research-project>.

Do you have any thoughts about what kind of project you might wish to pursue or with whom?

6. Public Outreach Project

This requirement of our PhD program is usually implemented later in your career here at Harvard. However, we list it here so that you can start thinking about what you might wish to do. Learn more here: <http://astronomy.fas.harvard.edu/public-outreach-project>

7. Signatures

Date

Signature of Student

I have discussed this study plan with the student and I approve it.

Date

Signature of Adviser

This signed form should be turned into Robb in (P-241) promptly. Paperclips rather than staples are HIGHLY appreciated.