

ASTRONOMY MAJOR

ADMISSION TO THE MAJOR

The standard introductory course for potential majors and other science-oriented students is ASTR155. It may be taken in the first or sophomore year. It assumes a good high school preparation in physics and some knowledge of calculus. Potential majors with a good knowledge of astronomy may place out of this course by demonstrating proficiency in the material; anyone wishing to do so should speak with the instructor. ASTR211 is a sophomore-level course appropriate for interested nonmajors as well as a gateway course to the major.

MAJOR REQUIREMENTS

The astronomy major is constructed to accommodate both students who are preparing for graduate school and those who are not.

The basic requirement for the major is successful completion of the required courses as well as four upper-level astronomy courses. The required upper-level courses are taken one each semester in the junior and senior years.

Code	Title	Hours
Required Courses:		
ASTR155	Introduction to Astrophysics	
ASTR211	Observational Astronomy	
MATH121	Calculus I	
MATH122	Calculus II	
MATH221	Vectors and Matrices	
PHYS113	General Physics I	
PHYS116	General Physics II	
PHYS213	Waves and Oscillations	
PHYS214	Quantum Mechanics I	
Four Upper-Level Astronomy Courses*:		
ASTR221	Galactic Astronomy	
ASTR222	Modern Observational Techniques	
ASTR224	Exoplanets: Formation, Detection, and Characterization	
ASTR231	Stellar Structure and Evolution	
ASTR232	Galaxies, Quasars, and Cosmology	
ASTR240	Radio Astronomy	
*Upper-level Astronomy course offerings may vary year-to-year.		

Code	Title	Hours
Strongly Recommended Courses:		
MATH222	Multivariable Calculus	
PHYS324	Electricity and Magnetism	
PHYS215	Special Relativity	
PHYS219	Introduction to Contemporary Physics (if PHYS215 is not offered)	

Additional upper-level physics courses are also recommended but are not required. Ability to program a computer in at least one of the widely used languages in the sciences, such as C, Fortran, or IDL, is also highly recommended. This does not necessarily mean that students should take a computer science

course. Potential majors with graduate school aspirations should complete or place out of the basic physics and mathematics courses listed above, preferably by the end of their sophomore year, and should also take ASTR155 and ASTR211 during their first two years.

Since physics GRE scores are an important admission criterion at most astronomy graduate schools, those planning to go on for a PhD are advised to double major in physics. This can be accomplished by taking several of the following additional courses, normally in the junior and senior years: PHYS324, PHYS313, PHYS315, and PHYS316. Check the published requirements for the physics major for more details and speak to your advisor.

Additional mathematics courses, such as MATH229, may also be chosen.

Click here (https://catalog.wesleyan.edu/departments/astr/ugrd-astr/%20https://wesfiles.wesleyan.edu/departments/acaf/AcafWeb/Advising%20Resources%20for%20Faculty/Astronomy_Major.pdf) for more detailed information about the astronomy major, including a sample eight-semester course plan.

STUDENT LEARNING GOALS

In this major, students are expected to acquire or develop:

- a broad understanding at an introductory level of the foundational concepts and recent discoveries that have shaped modern astronomy and astrophysics;
- proficiency at an advanced level with the theoretical concepts and observational tools employed in four or more distinct subfields of astrophysics;
- firsthand experience with the process of science through participation in research;
- the technical and research skills needed to pursue graduate study in astronomy;
- analytical abilities and computing skills useful for careers outside of professional astronomy.

BA/MA PROGRAM

[wesleyan.edu/grad/degree-programs/bama.html (<http://www.wesleyan.edu/grad/degree-programs/bama.html>)]

This program provides an attractive option for science majors to enrich their course and research background. Students are advised to begin research by their junior year if they intend to pursue the BA/MA. Admission is competitive and based on GPA, faculty recommendations, and research experience.

ADDITIONAL INFORMATION

All astronomy majors are to enroll each year in the .25-credit courses ASTR430 and ASTR431. These discussion courses provide a broad exposure and introduction to research and education topics of current interest to the astronomical community. Majors are also encouraged to serve as teaching apprentices in a general education course at least once during their junior or senior year, to take part in the observing program with the department's 24-inch telescope, and to participate in the department's public outreach activities.

HONORS

Students considering graduate school are strongly urged to do a senior thesis project (ASTR409/ASTR410); honors in astronomy requires completion of a senior thesis. Students with an interest in planetary science are advised to look at the course cluster information on that topic.

CAPSTONE EXPERIENCE

Research is an integral part of an undergraduate education in astronomy, and all majors are required to complete a senior research capstone that provides experiences beyond those obtained as part of their academic coursework. The capstone, to be completed during the twelve months prior to graduation, can take several forms:

- completion of a senior thesis project
- non-thesis related astronomy research
- in-depth investigation of a current research topic, including a short written report

In all cases, students must present some aspect of their experience in a public forum, e.g., by speaking in the ASTR 431 research seminar, presenting a poster at the Wesleyan summer research program poster session, or making a presentation at a professional conference.