

Astronomy Major FAQ

What classes do Astronomy Majors take (Bachelor of Science, B.S.) ?

The Astronomy major is an *intensive* study of Mathematics, Physics and Astrophysics. All students will take 3 semesters of Calculus, 1 semester of Differential Equations, and 1 semester of Advanced Math Techniques as well as the same set of core Physics classes that Physics majors take (introductory Physics 4 semesters plus upper division classes in Theoretical Mechanics, Electricity & Magnetism, Quantum Mechanics, and Thermodynamics). The Astronomy major classes (ASTR 250, 300a, 300b, 302, 400a, 400b) require this foundation of MATH and PHYS classes to develop the Astrophysics. Students will also learn scientific computer programming (PHYS 305). The B.S. program is designed to prepare students to continue to graduate school to pursue a Ph.D. in Astrophysics and for a career in Astronomy. The University of Arizona Astronomy program is one of the most successful undergraduate programs in the world.

How do I declare as an Astronomy Major?

You may declare as an Astronomy major if you have met with an Astronomy major advisor. After meeting with an advisor, you may officially declare the major by sending an email to the department Academic Advisor Holly Brown (brownhb@email.arizona.edu).

How do find out who is my Astronomy Department advisor?

After the beginning of the Fall semester, all new ASTR majors will be assigned an Astronomy Department advisor. This person is your academic advisor and career mentor. If you don't know who your advisor is, please contact Amanda Morris (morrisa1@email.arizona.edu, 520-621-2288) in the Steward Observatory Academic Office (933 N. Cherry Ave – office is located immediately next to the main lobby)

Can I complete the Astronomy Major in less than 4 years?

If you are an incoming freshman, then it is not possible to complete the Astronomy major in less than 4 years. Many of the Astronomy, Physics, and Math courses required for the Astronomy major must be taken in a specific sequence to satisfy the prerequisites for the courses. Unfortunately, there is no shortcut. Example four-year plans are available on the Department webpage.

If you are a transfer student or changing your major to Astronomy, then if you have completed MATH 129 (Calculus II) and PHYS (141 or 161H), you can complete the ASTR major in 3 additional years (if starting with ASTR 250). If you have not taken these MATH and PHYS classes, it will take 4 years to complete an ASTR major.

I have tested into a MATH class that is below Calculus I (MATH 122AB or MATH 125), can I still complete the Astronomy major in 4 years?

It will take more than 4 years to complete the Astronomy major if you do not start the MATH sequence with Calculus I (or higher level math). The initial MATH, PHYS, and ASTR classes have a specific sequence that cannot be shortcut. The first PHYS class (PHYS 141 or PHYS 161H) **REQUIRES** completion (or testing out of) Calculus I (MATH 122AB or MATH 125). The introductory ASTR class (ASTR 250) requires completion of the first semester PHYS class **AND** second semester Calculus (MATH 129). It is strongly recommended to **NOT** attempt to take both PHYS161H and MATH 129 over the summer in an attempt to catch up (this has gone badly for past students). If you test into Pre-Calculus (MATH120R) and can take this class during a summer session or at your local college BEFORE the start of your first semester at the University, then it is possible to be on track for graduation in 4 years. If you have taken high school Calculus but test into a lower level Math class, it is recommended that you consider taking the university math placement exam again.

I have taken an AP Calculus exam – may I test out of Calculus I or II?

Yes. The Math Department recognizes AP credit for Calculus – all inquiries should be directed to the Math Department (Astronomy advisors cannot switch your Math classes – this can only be done by a Math advisor or College of Science advisor).

May I use AP Physics credit to test out of first semester Physics (PHYS 141 or 161H)?

The PHYS department does not recognize high school AP PHYS credit. In extraordinary cases, the PHYS department can administer a final exam for PHYS 161H. The level of rigor between high school and university level Physics is significantly different such that all students are required to take first semester Physics at the University. First semester PHYS at the University also has a substantial laboratory component which is not replicated in many high school PHYS classes.

I am not in the Honors College and the four year plan recommends I take PHYS 161H, 162H, etc. – how do I sign up for these classes?

While it is possible to take the non-Honors PHYS 141, 142, 241, 243 sequence, Astronomy majors are recommended to take the more rigorous PHYS 161H, 162H, 261H, 263H sequence. If you are not in the Honors College, you may sign up for these classes by using a drop/add form in the Physics Department Academic Support Office (PAS 260).

How do I receive AP credit for my Gen-Ed classes?

If you have received your AP scores for Gen-Ed classes (i.e. AP History etc.), you should contact an academic advisor at the College of Science to have those credits applied. Astronomy department advisors cannot assign Gen-Ed AP credits.

Does the Astronomy Major require a Minor subject?

No. The Astronomy major is a rigorous degree that does not require a Minor for graduation with a Bachelor of Science (B.S.) at The University of Arizona. However, many of our majors choose to take minors. Some popular minors include: Planetary Sciences, Astrobiology, and Mathematics. Four year plans for various minor combinations may be found on the departmental webpage.

I am a transfer student, do my ASTR credits count?

The Astronomy Department advisors can tell you if your ASTR credits from another institution transfer (we cannot make decisions for Math, Physics, or Gen-Ed classes – those units must be evaluated by the Math and Physics departments or the College of Science for Gen-Ed classes). Introductory ASTR classes do **NOT** count toward the major OR Gen-Ed requirements. Unless you have taken a calculus-based, rigorous introductory astrophysics course, your ASTR credits are unlikely to count toward the Astronomy major at The University of Arizona.

What is ASTR 196 and should I take it?

ASTR 196 is a freshman Astronomy major seminar (1 unit) that all incoming freshman ASTR majors are encouraged to take. The seminar will introduce students to basic astronomical concepts as well as problem solving strategies. It is not required for completion of the ASTR major, but it is highly recommended.

May I take an introductory (Gen-Ed Tier 1 or Tier 2) ASTR courses (i.e. ASTR 170B, ASTR 201, 202, 203, 204)?

None of these classes count for the ASTR major **OR** for the Gen-Ed requirements for the Astronomy major. You are not allowed to sign up for the Tier 1 Gen-Ed courses ASTR 170B1 or ASTR/PTYS 170B2. These classes are not rigorous. Astronomy majors will take ASTR 250, a Calculus-based introduction to Astrophysics.

Are there scholarship opportunities within the Astronomy Department?

Yes and you should apply! The Astronomy Department has over \$30,000 in endowed scholarship money available to students every year. While many of the large, prize scholarships are only available to junior and senior level students, there ***ARE*** scholarships available for freshman and sophomore level students. The deadline for scholarship applications is typically at the beginning of the Spring semester (late January). Please check your university email regularly to receive updates about scholarship opportunities.

What is an REU and when should I apply?

An REU is a “Research Experience for Undergraduates” that occurs over the summer months at another institution (i.e. Harvard, Cornell, NRAO/VLA, Hawaii, etc.). Many REU programs are targeted to Astronomy majors. Students do paid, directed research with an advisor for summer months. Having research experience is an important component of graduate school applications and REUs are a great way to gain that experience as well as identify another letter writer for your graduate school applications. It is recommended that Astronomy majors start applying for REUs between their second and third year. While it is rare for a sophomore student to be selected (most REU students are between junior and senior year), you can’t win a position if you don’t try! A list of REU programs may be found at: https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=5045
Typical deadlines for applications are January-February.

Do I need a Ph.D. to be an Astronomer ?

There are many career paths that only require a Bachelors of Science (B.S.) in Astronomy. However, if your goal is to be a professor at a college or a university or a research scientist, a Ph.D. is required. You should talk with your faculty advisor and mentor about career options.

How long will it take for me to get a Ph.D. ?

The Astronomy Major B.S. is a four year program that prepares you to enter graduate school to pursue a Ph.D. The typical length of a Ph.D. program is 5 – 6 years at institutions in the USA. Thus, the total time is 9 – 10 years to a Ph.D. A common question is – “Won’t that cost a lot of money to obtain a Ph.D.?”. Unlike undergraduate studies where you have to pay tuition, graduate students are paid a salary that covers tuition and living expenses. As an example, the typical astronomy graduate students at the University of Arizona make ~\$30,000 per year.

How do I get involved in research in the Astronomy Department?

All of our Astronomy majors are expected to do research as part of their degree requirements (ASTR 499 typically taken junior and senior years). At the beginning of the Fall semester, an email with research opportunities is sent to all ASTR majors. Another program all Astronomy majors should consider applying for is the NASA Space Grant Program (<https://spacegrant.arizona.edu/> with a typical deadline early July) where students do a paid research internship during the academic year (2 semesters). The undergraduate Astronomy Club (<http://uaastroclub.org/>) is also involved in group research projects – check their website for weekly meeting times and to learn about group research opportunities.

Is there a topic or area of astronomy that you are interested in? Check the department webpage (<https://www.as.arizona.edu/people>) to find which faculty members are active in that area of research. Be proactive! Write them an email or knock on their office door and ask if they have any research projects for undergraduates.

I rarely use email – why doesn't the Astronomy department send out information via Twitter, Instagram, Facebook, Snapchat etc. ?

Unfortunately it is not currently possible, for legal reasons, to use these social media platforms for official communications. Your university email account is the official, legal method that we can use to communicate with you. Please check your university email account regularly (*at least daily*) for important announcements about classes, scholarships, research opportunities, etc.

"I have taken the introductory Math, Physics and ASTR 250 courses and while I love Astronomy, I realize that the Astronomy Major (B.S.) may not be for me."

Have you considered the option of an Astronomy Minor? Since you have already taken these classes, you can make them count toward the science track of the Astronomy Minor. Other majors may require a minor subject for graduation. Please schedule an appointment with Professor Tom Fleming (taf@as.arizona.edu) to switch to an Astronomy minor.