

Requirements for the Astrophysics Minor

A total of **20** credit hours are required for the minor, although there are additional requirements in math and physics that are needed for pre-requisites. (See bottom of 2nd page for more information.)

The following courses are required for the minor, adding up to 12 credit hours.

AST 321 Introduction to Planetary and Stellar Astrophysics (3)*
AST 322 Introduction to Galactic and Extragalactic Astrophysics (3)*
AST 421 Astrophysics I (3)*
AST 422 Astrophysics II (3)*

Students must also choose one of the following options for the additional 8 credit hours

Option #1:

SES 121 Earth, Solar System, and Universe I (3)*
SES 123 Earth, Solar System, and Universe II (1)*
SES 122 Earth, Solar System, and Universe Lab I (3)
SES 124 Earth, Solar System, and Universe Lab II (1)

Option #2:

AST 111 Introduction to Solar Systems Astronomy (3)*
AST 113 Astronomy Laboratory I (1)*
AST 112 Introduction to Stars, Galaxies, and Cosmology (3)*
AST 114 Astronomy Laboratory II (1)*

Option #3:

At least 8 credit hours of SES or AST upper division electives; these may include (but are not limited to):
AST 498 Topic: Astrophysics Seminar (1)
SES 311 Essentials of Astrobiology (3)*
AST 494 Observing Instrumentation and Data Analysis (3)*

*To secure SQ credit, both courses in the following combinations must be taken: AST321 and AST113, AST322 and AST114, SES121 and SES123, AST111 and AST113, AST112 and AST114

Certain courses in the minor may have higher math and/or physics pre-requisites.

ADVISING PROCEDURES

The DARS system will be used for tracking student progress and verifying completion of the minor. All students will be required to meet with an academic advisor in the School of Earth and Space Exploration (SESE) to declare the minor and confirm that the requirements are being met. SESE requires students to fill out the Change to Academic Plan form at the following website to indicate the addition of a minor: <https://clas.asu.edu/current-students/forms-and-instructions> . Once the form has been filled out, the student's major advisor can officially add the minor for the student.

Students must take at least 12 of the 20 units required for the minor at ASU. Transfer coursework must be evaluated by a SESE advisor before it can be applied toward the minor requirements. Students must

receive a C or better in all required courses for the minor. **Note: students cannot double count courses in their minor toward the CORE classes in their major. Therefore certain combinations of majors and minors are not permitted.**

Astrophysics Minor Pre-requisites

| Course | Title | Offering | Pre-requisites |
|--------|---|----------|---|
| AST321 | Intro Planetary/Stellar Astrophysics | F | Pre-requisites: MAT266 or MAT271 with C or better; PHY121/122 or PHY 150 with C or better |
| AST322 | Intro Galactic/Extragalactic Astrophysics | S | Pre-requisites: MAT266 or MAT271 with C or better; PHY 150 or PHY 121/122 with C or better |
| AST421 | Astrophysics I | S | Pre-requisites: PHY252 C or better; AST 321 or AST 322 with C or better |
| AST422 | Astrophysics II | F | Pre-requisites: PHY252 C or better; AST 321 or AST 322 with C or better |
| SES121 | Earth, Solar Sys, and Universe I | F | Mathematics Placement Test with a score of 50% or higher or Pre- or corequisite(s): MAT170 (or MAT171, MAT210, MAT251, MAT265 or 270) with C or better if completed |
| SES122 | Earth, Solar Sys, and Universe II | S | Pre-requisites: SES 121 with C or better |
| SES123 | Earth, Solar Sys, and Universe I Lab | F | Pre or co-req: SES121 (C or better if completed) |
| SES124 | Earth, Solar Sys, and Universe II Lab | S | Pre or co-req: SES122 (C or better if completed) |
| AST111 | Intro to Solar Systems Astronomy | F | |
| AST113 | Astronomy Lab I | F | Pre-or Co-requisites: AST 111 or 112 or AST 321 (C or better) |
| AST112 | Intro Stars, Galaxies & Cosmology | S | |
| AST114 | Astronomy Lab II | S | Pre-or Co-requisites: AST 111 or 112 or AST 322 (C or better) |
| SES311 | Astrobiology | S | Pre-requisites: MAT 265 or MAT 270; PHY 121 or CHM 113 or BIO 188 |

F=Fall, S=Spring

Additional Math and Physics requirements necessary for the completion of this minor:

MAT265 (3) or MAT270 (4) Calculus I
 MAT266 (3) or MAT271 (4) Calculus II
 MAT267 (3) or MAT272 (4) Calculus III
 PHY121/122 (3/1) or PHY150 (4) Physics I
 PHY131/132 (3/1) or PHY151 (4) Physics II
 PHY252 (4) Physics III