

The BS degree in Earth and Space Exploration, Concentration in Astrophysics requires the following core courses (34 credits):

SES 100 Intro to Exploration (3)	AST 421 Astrophysics I (3)
1SES 121 Earth, Solar Sys, & Univ I (3)	AST 422 Astrophysics II (3)
1SES 122 Earth, Solar Sys, & Univ II (3)	AST 498 Astrophysics Seminar (1)*
1SES 123 Earth, Solar Sys, & Univ Lab I (1)	PHY 314 Quantum Physics I (3)
1SES 124 Earth, Solar Sys, & Univ Lab II (1)	GLG 400 SESE Colloquium (1)*
AST 321 Intro Planetary and Stellar Astro. (3)	SES 410 Senior Exploration Project I (3)
AST 322 Intro Galactic & Extragalactic Astro. (3)	SES 411 Senior Exploration Project II (3)

1For Arizona community college students, the full sequence of AST111-114 can be substituted for SES121-124  
\* AST498 was previously listed as AST494: Astrophysics Seminar. Only one semester each of astrophysics seminar and SESE colloquium are required. Students in the catalog year 2016 and beyond are not required to take GLG400.

In addition, 3 units of upper division electives from SES/AST/GLG/PHY, particularly from the following courses, but others can be substituted with advisor approval (3 credits):

AST 494 Observ Instr and Data Analysis (3)	PHY 311 Classical Particles, Fields & Matter II (3)
GLG 404 Fundamentals Planetary Geology (3)	PHY 312 Mechanics and Electromagnetism (3)
SES 350 Eng Syst & Exp Problem Solving (3)	PHY 315 Quantum Physics II (3)
SES 311 Essentials of Astrobiology (3)	PHY 361 Introductory Modern Physics (3)
PHY 302 Mathematical Methods in Physics II (3)	PHY 441 Statistical and Thermal Physics (3)
PHY 310 Classical Particles, Fields & Matter I (3)	

Required courses in other related fields include the following (30 credits):

MAT 270 Calculus with Analytic Geometry I (4)\*  
MAT 271 Calculus with Analytic Geometry II (4)\*  
MAT 272 Calculus with Analytic Geometry III (4)\*  
MAT 275 Modern Differential Equations (3)  
PHY150 Physics I (4)\*\*  
PHY 151 Physics II (4)\*\*  
PHY 201 Mathematical Methods in Physics (3)  
PHY 252 Physics III (4)

\*MAT265/266/267 may be taken in place of MAT270/271/272

\*\*PHY121/122 and PHY131/132 may be taken in place of PHY150 and PHY151

**Notes:**

- **Students must receive C's or better in all of the above courses in order for them to count toward the major**
- **The major map represents the official catalog for the degree**
- **Substitutions for any of the requirements above must be approved by a SESE advisor and the student must notify the advisor if substitutions or other requirements are not showing up on the DARS correctly**