

The BS degree in Earth and Space Exploration, Concentration in Exploration Systems Design requires the following core courses (35 units):

SES 100 Introduction to Exploration (3)	MAE 212 Engineering Mechanics (4)*
SES 121 Earth, Solar Sys, & Univ I (3)	SES 330 Electronics Instrumentation (4)
SES 122 Earth, Solar Sys, & Univ II (3)	SES 350 Eng Syst & Exper Prob Solving (3)*
SES 123 Earth, Solar Sys, & Univ Lab I (1)	SES 405 Exploration Systems Engineering (3)
SES 124 Earth, Solar Sys, & Univ Lab II (1)	SES 410 Senior Exploration Project I (3)
EEE 202 Circuits (4)*	SES 411 Senior Exploration Project II (3)

In addition, one elective course must be taken (3 units). Suggested courses include:

AST 321 Intro Planet & Stellar Astr (3)	GLG 424 Petrology (3)
AST 322 Intro Galactic & Extragalactic Astr (3)	GLG 471 Hydrology (3)
AST 494 Observ Inst. and Data Analysis (3)	SES 311 Essentials of Astrobiology (3)
GLG 321 Mineralogy (3)	SES 494 Mobile Robotics: Design & Control (3)
GLG 404 Fundamentals Planetary Geology (3)	

Required courses in other related fields include the following (24 units):

CHM 114 General Chemistry for Engineers (4)  
MAT 265 Calculus for Engineers I (3) or MAT 270 Calculus with Analytic Geometry I (4)  
MAT 266 Calculus for Engineers II (3) or MAT 271 Calculus with Analytic Geometry II (4)  
MAT 267 Calculus for Engineers III (3) or MAT 272 Calculus with Analytic Geometry III (4)  
MAT 275 Modern Differential Equations (3)  
PHY 121 University Physics I: Mechanics (3)  
PHY 122 University Physics Laboratory I (1)  
PHY 131 University Physics II: Electricity and Magnetism (3)  
PHY 132 University Physics Laboratory II (1)

**\*Students in catalog years 2012 and prior:** SES210, SES310 and 6 additional credits of SES electives were required in place of MAE212, EEE202 and SES350; however, SES210 and SES310 are no longer available. Students in these previous catalog years who have not already taken SES210 and SES310 are now required to take MAE212, EEE202, SES350 and only 3 credits of SES electives. Students who took SES210 but not SES310, cannot take SES350 and should substitute SES310 with the addition of another SES elective course (for a total of 12 credits of SES electives). Students who took SES310 but not SES210 can take SES350 in place of SES210 and will still take 6 credits of SES electives as noted on their major map. Students who already took SES210 and SES310 cannot take SES350 and need 9 credits of SES electives, as noted on their major map. All students are encouraged to take MAE212 and EEE202. They are important engineering courses for students interested in systems design.

**\*\*Students who took CHM113 and CHM116 may substitute BOTH courses for CHM114**

**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**