

# MAJOR IN EARTH-SPACE SCIENCE

The Department of Physics, Astronomy and Geosciences offers an undergraduate program leading to a Bachelor of Science in Earth-Space Science. This program is intended for students interested in secondary education, and is not appropriate for students interested in a professional career in geology. The program is designed to result in state certification to teach earth-space science at the secondary level, after the student completes the additional requirements of the Department of Secondary Education. Students must contact the Department of Secondary Education about admission to the Secondary Teacher Education Program after completing 45 units. A total of 57-58 units are required in this major, 12 of which also satisfy Core Curriculum requirements. Within the Earth-Space Science major, 34-35 required and elective units are within the earth, atmospheric, oceanographic and space sciences. The remaining units in the major are in the supporting physical and mathematical sciences. All required courses in this track must be completed with a grade equivalent of 2.00 or higher. The additional Core Curriculum requirements must also be completed.

Earth-Space Science Secondary majors in the Secondary Education Concentration are eligible, upon graduation, to apply for certification to teach earth-space science for grades 7-12 in the state of Maryland.

The Earth-Space Science Secondary Education Concentration requires 127-129 units for completion. Students in this concentration must complete 100-102 required units in content and Towson UTeach courses and 27 units in Core Curriculum courses not satisfied by the major, earning a grade equivalent of 2.00 or higher in each course.

## Requirements

Code	Title	Units
<b>Required Courses</b>		
ASTR 161	THE SKY AND THE SOLAR SYSTEM	4
ASTR 181	STARS, GALAXIES, AND THE EARLY UNIVERSE	4
BIOL 120 & 120L	PRINCIPLES OF BIOLOGY [LECTURE] and PRINCIPLES OF BIOLOGY [LAB]	4
CHEM 131 & 131L	GENERAL CHEMISTRY I LECTURE and GENERAL CHEMISTRY I LABORATORY	4
CHEM 132 & 132L	GENERAL CHEMISTRY II LECTURE and GENERAL CHEMISTRY II LABORATORY	4
GEOG 373 or GEOG 377	CLIMATOLOGY or METEOROLOGY	3
GEOL 121	PHYSICAL GEOLOGY	4
GEOL 123	HISTORICAL GEOLOGY	4
GEOL 305	ENVIRONMENTAL GEOLOGY	4
GEOL 331	MINERALOGY	4
GEOL 357	OCEANOGRAPHY	3
PHYS 211	GENERAL PHYSICS I; NON CALCULUS-BASED	4
PHYS 212	GENERAL PHYSICS II; NON CALCULUS-BASED	4

**Geosciences or Geography Elective**

Select one of the following:		3-4
ASTR 301	COSMIC ORIGINS	
ASTR 371	PLANETARY ASTRONOMY	
GEOG 232	INTRO TO GEOGRAPHIC INFORMATION SCIENCE	
GEOG 315	GEOMORPHOLOGY	
GEOG 410	ENVIRONMENTAL GEOGRAPHY	
GEOG 411	STUDIES IN NATURAL HAZARDS	
GEOL 321	STRUCTURAL GEOLOGY	
GEOL 415	HYDROGEOLOGY	
GEOL 443	SEDIMENTOLOGY AND STRATIGRAPHY	

### Mathematics Elective

Select one of the following:		3-4
MATH 115	COLLEGE ALGEBRA	
MATH 119	PRE-CALCULUS	
MATH 211	CALCULUS FOR APPLICATIONS	
MATH 273	CALCULUS I	

**Total Units** **56-58**

## Four-Year Plan of Study

### Sample Four-Year Plan

The selected course sequence below is an example of the simplest path to degree completion. Based on course schedules, student needs, and student choice, individual plans may vary. Students should consult with their adviser to make the most appropriate elective choices and to ensure that they have completed the required number of units (120) to graduate.

#### Freshman

Term 1	Units	Term 2	Units
BIOL 120 & 120L (Core 8)	4	CHEM 132 & 132L	4
CHEM 131 & 131L (Core 7)	4	GEOL 123	4
GEOL 121	4	MATH 115, 119, 211, or 273 (Core 3)	3
Core 1 (or Core 2)	3	Core 2 (or Core 1)	3
		Elective	3
		<b>15</b>	<b>17</b>

#### Sophomore

Term 1	Units	Term 2	Units
ASTR 161	4	ASTR 181	4
PHYS 211	4	PHYS 212	4
Core 4	3	Core 6	3
Core 5	3	Core 9	3
Elective	3	Elective	3
		<b>17</b>	<b>17</b>

#### Junior

Term 1	Units	Term 2	Units
GEOL 357	3	GEOG 373 or 377	3
Geosciences or Geography Elective	3-4	Core 12	3
Core 10	3	Core 13	3
Core 11	3	Elective	3-4

Elective	3-4 Elective	3-4
	<b>15-17</b>	<b>15-17</b>
<b>Senior</b>		
<b>Term 1</b>	<b>Units Term 2</b>	<b>Units</b>
GEOL 305	4 Elective	3-4
GEOL 331	4 Elective	3-4
Core 14	3 Elective	3-4
Elective	3-4 Elective (optional)	3-4
	<b>14-15</b>	<b>12-16</b>
<b>Total Units 122-131</b>		

<sup>1</sup> This elective is optional and only necessary if the student is not on target to earn 120 units by the end of their final term.

## Learning Outcomes

1. Each graduate will demonstrate a comprehensive understanding of the constitution of the earth and its history in the solar system.
2. Each graduate will be able to articulate scientific information through creative persuasive and influential presentations in both oral and written formats.
3. Each graduate will be able to demonstrate information literacy and technological competency using electronic database resources in order to develop an argument and organize supporting materials.