School of Earth and Space Exploration
Arizona State University

Catalog Year: 2025-2026

Requirements for the Certificate in Planetary Science

The certificate requires a minimum of 18 credit hours. At least 12 credit hours must be completed in upper-division course work and at least 9 credit hours must be completed at ASU. At least six upper-division hours in the certificate must be completed in courses offered by the College of Liberal Arts and Sciences. A grade of "C" (2.00 on a 4.00 scale) or higher is required for each course used to fulfill a certificate requirement.

Additional prerequisite requirements may include completion of the following courses or their equivalents with a grade of "C" or higher:

- GLG 101: Introduction to Geology I (Physical) and GLG 103: Laboratory; or SES 121: Earth, Solar System and Universe, and SES 123: Laboratory
- a math course at the level of MAT 266: Calculus for Engineers II or higher
- a chemistry course at the level of CHM 113: General Chemistry I or higher
- a physics course at the level of PHY 121: University Physics I: Mechanics and PHY 122: Laboratory or higher

Required Courses – 9 or 10 credit hours

One introductory 100-level course from the following (3-4 credits):

- AST 111: Introduction to Solar Systems Astronomy OR
- GLG 101: Introduction to Geology I (Physical) OR
- SES 100: Introduction to Exploration OR
- SES 106: Habitable Worlds OR
- SES 107: A Solar System Journey OR
- SES 121: Earth, Solar System and Universe

GLG 404: Fundamentals of Planetary Geology
SES 421: Foundations of Planetary Science

Electives (choose three) – 9 credit hours

AST 494: Exoplanets
GLG 321: Mineralogy or GLG 424: Petrology
GLG 362: Geomorphology
GLG 406: Geology of Mars
GLG 418: Geophysics or GLG 419: Geodynamics
GLG 420: Volcanology or GLG 422: Planetary Volcanology
GLG 485: Meteorites and Cosmochemistry
GLG 490: Remote Sensing
SES 294: Introduction to Space Weather
SES 311: Essentials of Astrobiology: Exploration for Life in the Universe or GLG 460: Astrobiology
SES 494: Geology of Venus
SES 494: Planetary Interiors

Students may also use other courses as electives, especially special topics courses (SES/AST/GLG 494 and/or GLG 490), chosen in consultation with an academic advisor in the School of Earth and Space Exploration.

The College of Liberal Arts and Sciences
PO Box 876004 Tempe, AZ 85287-6004
p: 480-965-5081 **f:** 480-965-8102 **web:** sese.asu.edu

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Enrollment Requirements

A student pursuing an undergraduate certificate must be enrolled as a degree-seeking student at ASU. Undergraduate certificates are not awarded prior to the award of an undergraduate degree. A student already holding an undergraduate degree may pursue an undergraduate certificate as a nondegree-seeking graduate student.

Planetary Science Certificate Core Requirements

Choose one from the following list (3 or 4 credits):				
Prefix	Course Title	Hours	Pre-requisites	Semester Offered
AST 111	Introduction to Solar Systems Astronomy	4		F/SS
GLG 101	Introduction to Geology I	3		F/S/SS
SES 100	Introduction to Exploration	3	ALEKS score of 61 or higher or Pre- or corequisite(s): MAT 170, 171, 210, 251, 265, or 270 with C or better if completed	F
SES 106	Habitable Worlds	4		F/S/SS
SES 107	A Solar System Journey	4		F/S/SS
SES 121	Earth, Solar System and Universe	3		F
Additional required core courses (both must be completed, 6 credits)				
Prefix	Course Title	Hours	Pre-requisites	Semester Offered
GLG 404	Fundamentals of Planetary Geology	3	GLG 101, GLG 102, SES 121, or SES 122 with C or better	F
SES 421	Foundations of Planetary Science	3	MAT 266 or 271 with C or better; PHY 121 and 122 (or PHY 150) with C or better	F

F=Fall; S=Spring; SS=Summer Session **Not offered in a regular pattern/may not be offered every year

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Planetary Science Certificate Electives

Choose three courses (9 credits)				
AST 494	Topic: Exoplanets	3	Instructor consent required. Suggested prerequisites: Math up through differential equations (PHY 201 or equivalent), coding experience (preferably python, PHY 202 or equivalent), and physics up through physics III (PHY 252 or equivalent)	S**
GLG 321	Mineralogy	3	CHM 113 or 114 with C or better; MAT 170, 210, 265 or 270 with C or better	F
GLG 362	Geomorphology	3	GLG 101, GLG 110, or SES 121 with C or better; MAT 170 with C or better	F**
GLG 406	Geology of Mars	3		S**
GLG 418	Geophysics	3	MAT 272 or 267 with C or better; PHY 131 and 132 (or PHY 151) with C or better	F
GLG 419	Geodynamics	3	MAT 267 or 272 with C or better; PHY 131 and 132 (or PHY 151) with C or better	S**
GLG 420	Volcanology	3	Engineering, Math or Science major; Minimum Junior standing	F**
GLG 422	Planetary Volcanology	3	GLG 420 with C or better	**
GLG 424	Petrology	3	GLG 321 with C or better	S
GLG 460	Astrobiology	3	AST 112, BIO 182, BIO 282, GLG 102, SES 122, or SES 126 with C or better; one 300-level course in AST, BIO, CHM, GLG, MIC, PHY, or SES with C or better	F**
GLG 485	Meteorites and Cosmochemistry	3	CHM 341, CHM 346, or GLG 321 with C or better; Credit is allowed for only GLG 485 or CHM 485	S**
GLG 490	Topic: Remote Sensing	3	Suggested prerequisites: Junior or Senior undergraduates, GLG 321 with C or better	F**
SES 294	Introduction to Space Weather	3		F
SES 311	Essentials of Astrobiology	3	BIO 181 (188), CHM 113 or PHY 121; MAT 265 or 270	S
SES 494	Topic: Geology of Venus	3		S**
SES 494	Topic: Planetary Interiors	3		S**

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