School of Earth and Space Exploration
Arizona State University

Catalog Year: 2025-2026

BA in Earth and Environmental Sciences: List of Approved Upper Division Electives
General Studies: MAROON

Requirements:

- Students must take at least 5 upper-division courses with topics related to the environment (15 credit hours minimum).
- At least 2 of the EES elective courses (6 credits) must be 400-level; all 5 courses must be upper division (300-499 level).
- If a student finds a course that they would like to take that is not on this list, they should consult with their SESE advisor for approval to apply the course as an EES major elective **prior to** registering for the course.

Special Notes:

- This is a resource document meant to help with planning only. Changes to courses and prerequisites are always occurring. Check the ASU Course Catalog for course offerings and prerequisite updates.
- Not all listed courses are offered at the Tempe Campus. Some may be taught exclusively at other ASU campuses.
- Make sure to check the legend at the bottom of this document and **When Offered** column. Not all courses are offered regularly in the given semesters and may be offered in alternating years only.

About the Elective Tracks:

- Students are encouraged to choose a focused track but they also have the option to choose any combination of courses across multiple tracks. Regardless of the chosen track, at least two electives (6 credits) must be 400-level.
- Each of the focused tracks has overlap with a related certificate program that students can choose to pursue along with the chosen track. Students should discuss this option and how to add a certificate with their academic advisor.

Earth and Environmental Sciences General Elective Track

The Earth and Environmental Studies General Elective Track includes all of the courses in the following tracks:

1) Climate/Environmental Change;
2) Earth Resources;
3) Environmental Education;
4) Environmental Management;
5) Environmental Policy; and
6) Sustainability

While students are encouraged to pick a focused track, students may opt to select courses across multiple tracks. Of the five major elective courses required, at least two of the courses (6 credits) must be 400-level.

Climate/Environmental Change Track (this track has some overlap with the Water Resources certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
ABS 350 Applied Statistics	3	F/S/SS	One course meeting General Studies MA requirement with C or better *(Offered at Polytechnic campus only)*	CS
ASB 326 Human Impacts on Ancient Environments	3	F or S**	Minimum 45 hours	SB + H
ASB 375 or SOS 375 Humans and the Environment: What's the Connection?	3	F or S**	ENG 101, 105 or 107 w/ C or better; min 45 hours; Credit is allowed for only ASB 375 or SOS	(L or SB) + G
ERM 426 Environmental Issues	3	SS/i	Minimum 45 hours	
ERM 428 International Environmental Management	3	S/i	Minimum 45 hours	G
FIS 444 or JUS 444 Environment and Justice	3	S**	ENG 102, 105, or 108 with C or better; minimum 36 hours; Credit is allowed for only FIS 444 or JUS 444	L + C
GIS 470: Advanced Statistics for Geography & Planning	3	F/S	DAT 300 or GIS 270 with C or better	CS
GLG 362 Geomorphology*	3	F	GLG 101, GLG 110, or SES 121 with C or better; MAT 170 with C or better	
GLG 435 Sedimentology and Stratigraphy*	3	S	GLG 102 or SES 122 with C or better	
GLG 470 Hydrogeology	3	F**		
GPH 314 Global Change	3	F/S/SS/i	Minimum 45 hours	HU + G SCI SOC
GPH 414 Climate Change	3	F/S/i	GPH 111 or 213 or 314 with C or better	G
JUS 332 Politics of Energy Policy and Justice	3	F/S**	ENG 102, 105, or 108 with C or better; minimum 24 hours	
PUP 442 Environmental Planning	3	F/SS/i	PUP 301 with C or better	
SOS 314 Basic Energy Science	3	F/S/SS/i	Minimum 45 hours	SCI SOC
SOS 320 Society and Sustainability	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; ENG 101, 105 or 107	L or SB

Climate/Environmental Change Track (this track has some overlap with the Water Resources certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
SOS 324 Sustainable Energy Technology and Systems	3	F/S/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; Credit is allowed for only EVE 411 or SOS 324	
SOS 326 Sustainable Ecosystems	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 444 Climate Change, Society and Sustainability	3	F/SS/i	minimum 45 hours; Credit is allowed for only SOS 444 or SOS 494 (Social Dimensions of Climate Change) or SOS 544 or SOS 598 (Social Dimensions of Climate Change)	
STP 420 Introductory Applied Statistics	3	F/S/SS/i	MAT 210, 251, 265, or 270 with C or better	CS

Earth Resources Track (this track has some overlap with the Geographic Information Science certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
ABS 350 Applied Statistics	3	F/S/SS	One course meeting General Studies MA requirement with C or better *(Offered at Polytechnic campus only)*	CS
ERM 428 International Environmental Management	3	S/i	Minimum 45 hours	G
GCU 364 Energy in the Global Arena	3	F		SCI SOC
GIS 311 Geographic Information Science III*	4	F/S/SS/i	GIS 211 with C or better	CS
GIS 322 Programming Principles GIS II	3	F/S/SS/i	GIS 222 with C or better OR Data Science BS major with either CSE 110, CSE 205, or GIS 222 with C or better	
GIS 341 Cartography and Georepresentation	3	F/S/SS/i	GIS 205 with C or better	CS
GIS 470 Advanced Statistics for Geography and Planning	3	F/S/i	DAT 300 or GIS 270 with C or better	CS

Earth Resources Track (this track has some overlap with the Geographic Information Science certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
GLG 301 Earth Science in Arizona and the Southwest	3	F	ENG 101, 105 or 107 with C or better; GLG 101, 102, 110, GPH 111 or SES 121; MAT 117 or higher; Credit is allowed for only GLG 301, 394 (Earth Sci in AZ & SW) or SOS 372	SCI SOC
GLG 304 or SOS 373 Minerals, Energy, and Society	3	S	ENG 101, 105 or 107 with C or better; GLG 101, GLG 102, GLG 110, GPH 111, SES 121, or minimum junior standing; Credit is allowed for only GLG 304, GLG 394 (Minerals, Energy & Society) or SOS 373	SCI SOC
GLG 310 Structural Geology*	3	F	GLG 101 or SES 121 with C or better; MAT 170, 171, 210, 251, 265, or 270 with C or better	
GLG 321 Mineralogy*	3	F	CHM 113 (or both CHM 111 and 117 or 114) with C or better; MAT 170, 210, 265 or 270 with C or better	
GLG 424 Petrology*	3	S	GLG 321 with C or better	
GLG 435 Sedimentology and Stratigraphy*	3	S	GLG 102 or SES 122 with C or better	
GLG 441 Ore Deposits	3	F**	GLG 101 or SES 121 with C or better; GLG 310 or 321 with C or better	
GLG 470 Hydrogeology	3	F**		
GPH 314 Global Change	3	F/S/SS/i	Minimum 45 hours	HU + G SCI SOC
GPH 381 Geography of Natural Resources	3	F/S/SS/i		G SCI SOC
GPH 414 Climate Change	3	F/S/i	GPH 111 or 213 or 314 with C or better	G
PUP 442 Environmental Planning	3	F/SS	PUP 301 with C or better	
SOS 320 Society and Sustainability	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; ENG 101, 105 or 107	L or SB
SOS 324 Sustainable Energy Technology and Systems	3	F/S/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; Credit is allowed for only EVE 411 or SOS 324	
SOS 325 The Economics of Sustainability	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
STP 420 Introductory Applied Statistics	3	F/S/SS/i	MAT 210, 251, 265, or 270 with C or better	CS

Environmental Education Track (this track has some overlap with the Environmental Education certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
ABS 302 Ethical and Policy Issues in Biology	3	F/S/SS/i	Minimum 45 hours	
BIO 324 or PHI 310 Environmental Ethics	3	F/SS/i	Credit is allowed for only BIO 324 or PHI 310	HU SCI SOC
ENG 371 Rhetoric of the Environmental Movement	3	F/i	ENG 102, 105 or 108 with C or better	
ERM 426 Environmental Issues	3	SS/i	Minimum 45 hours	
FIS 444 or JUS 444 Environment and Justice	3	S**	ENG 102, 105, or 108 with C or better; minimum 36 hours; Credit is allowed for only FIS 444 or JUS 444	L + C
GIS 470 Advanced Statistics for Geography and Planning	3	F/S/i	DAT 300 or GIS 270 with C or better	CS
GPH 314 Global Change	3	F/S/SS/i	Minimum 45 hours	HU + G SCI SOC
GPH 381 Geography of Natural Resources	3	F/S/SS/i		G SCI SOC
GPH 414 Climate Change	3	F/S/i	GPH 111 or 213 or 314 with C or better	G
JUS 332 Politics of Energy Policy and Justice	3	F/S**	ENG 102, 105, or 108 with C or better; minimum 24 hours	
JUS 456 or SOS 456 Human Rights and Sustainability	3	F**	ENG 102, 105, or 1008 with C or better; minimum 36 credit hours; Credit is allowed for only JUS 456 or JUS 497 (Seminar in Human Rights) or SOC 455 or SOS 456	(L or SB) + G
POS 300 Contemporary Global Controversies	3	F/S/SS/i		SB + G
PUP 442 Environmental Planning	3	F/SS/i	PUP 301 with C or better	
SCN 300 Foundations of Environmental Education	3	F/S/i		
SCN 302 Environmental Education	3	F/S/i	ENG 101, 105, or 107 with C or better	L + G
SCN 307 Biomimicry: Nature's Sustainable Solutions	3	F/i	Minimum 45 hours	G

Earth Resources Track (this track has some overlap with the Geographic Information Science certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
SCN 308 Urban Environmental Education	3	S/i	Minimum 45 hours	
SCN 310 Biodiversity Conservation: An Educational Inquiry	4	F/S/i	Minimum 45 hours; Credit is allowed for only SCN 310 or SCN 294 (Biodiversity Conservation) or SCN 494 (Biodiversity Conservation)	
SCN 401 Sustainability Science, Technology, and Society	3	F	Non-Teacher Preparation student; minimum junior standing; Credit is allowed for only SCN 400 or SCN 401	
SOS 444 Climate Change, Society and Sustainability	3	F/SS/i	minimum 45 hours; Credit is allowed for only SOS 444 or SOS 494 (Social Dimensions of Climate Change) or SOS 544 or SOS 598 (Social Dimensions of Climate Change)	
STP 420 Introductory Applied Statistics	3	F/S/SS/i	MAT 210, 251, 265, or 270 with C or better	CS

Environmental Management Track (this track has some overlap with the Geographic Information Science certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
ABS 350 Applied Statistics	3	F/S/SS	One course meeting General Studies MA requirement with C or better *(Offered at Polytechnic campus only)*	CS
BIO 324 or PHI 310 Environmental Ethics	3	F/SS/i	Credit is allowed for only BIO 324 or PHI 310	HU SCI SOC
BIO 412 Conservation in Practice	3	S**	Minimum 45 hours; Credit is allowed for only BIO 412 or SOS 412	
CEE 400 Earth Systems Engineering and Management	3	F/S/SS	Civil Engineering BSE major; CEE 300 with C or better; ENG 101, 105 or 107 with C or better OR non-CEE junior or senior; ENG 101, 105, or 107 with C or better; Credit is only allowed for CEE 400 or CNE 400	(L or HU) + H SCI SOC
ERM 426 Environmental Issues	3	SS/i	Minimum 45 hours	
ERM 428 International Environmental Management	3	S/i	Minimum 45 hours	G

Environmental Management Track (this track has some overlap with the Geographic Information Science certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
GIS 311 Geographic Information Science III*	4	F/S/SS/i	GIS 211 with C or better	CS
GIS 322 Programming Principles GIS II	3	F/S/SS/i	GIS 222 with C or better OR Data Science BS major with either CSE 110, CSE 205, or GIS 222 with C or better	
GIS 341 Cartography and Georepresentation	3	F/S/SS/i	GIS 205 with C or better	CS
GIS 470 Advanced Statistics for Geography and Planning	3	F/S/i	DAT 300 or GIS 270 with C or better	CS
GLG 304 or SOS 373 Minerals, Energy, and Society	3	S	ENG 101, 105 or 107 with C or better; GLG 101, GLG 102, GLG 110, GPH 111, SES 121, or minimum junior standing; Credit is allowed for only GLG 304, GLG 394 (Minerals, Energy & Society) or SOS 373	SCI SOC
GLG 362 Geomorphology*	3	F	GLG 101, GLG 110, or SES 121 with C or better; MAT 170 with C or better	
GLG 470 Hydrogeology	3	F**		
GPH 314 Global Change	3	F/S/SS/i	Minimum 45 hours	HU + G SCI SOC
GPH 381 Geography of Natural Resources	3	F/S/SS/i		G SCI SOC
GPH 414 Climate Change	3	F/S/i	GPH 111 or 213 or 314 with C or better	G
HST 345 Environmental History	3	F/S/i	ENG 102, 105, 108 or 112 with C or better	L
POS 300 Contemporary Global Controversies	3	F/S/SS/i		SB + G
PUP 301 Introduction to Urban Planning	3	F/S/SS/i	ENG 101, ENG 105, or ENG 107 with C or better	L
PUP 442 Environmental Planning	3	F/SS/i	PUP 301 with C or better	
STP 420 Introductory Applied Statistics	3	F/S/SS/i	MAT 210, 251, 265, or 270 with C or better	CS

Environmental Policy Track (this track has some overlap with the Energy and Sustainability certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
ABS 302 Ethical and Policy Issues in Biology	3	F/S/SS/i	Minimum 45 hours	
ABS 350 Applied Statistics	3	F/S/SS	One course meeting General Studies MA requirement with C or better *(Offered at Polytechnic campus only)*	CS
BIO 324 or PHI 310 Environmental Ethics	3	F/SS/i	Credit is allowed for only BIO 324 or PHI 310	HU SCI SOC
BIO 412 Conservation in Practice	3	S**	Minimum 45 hours; Credit is allowed for only BIO 412 or SOS 412	
ENG 371 Rhetoric of the Environmental Movement	3	F/i	ENG 102, 105 or 108 with C or better	
ERM 426 Environmental Issues	3	SS/i	Minimum 45 hours	
ERM 428 International Environmental Management	3	S/i	Minimum 45 hours	G
FIS 334 or JUS 334 Science, Technology and Inequality	3	F	Minimum 45 hours; Credit is allowed for only FIS 334 or JUS 334	C
FIS 444 or JUS 444 Environment and Justice	3	S**	ENG 102, 105, or 108 with C or better; minimum 36 hours; Credit is allowed for only FIS 444 or JUS 444	L + C
GIS 470 Advanced Statistics for Geography and Planning	3	F/S/i	DAT 300 or GIS 270 with C or better	CS
GPH 314 Global Change	3	F/S/SS/i	Minimum 45 hours	HU + G SCI SOC
GPH 414 Climate Change	3	F/S/i	GPH 111 or 213 or 314 with C or better	G
HST 345 Environmental History	3	F/S/i	ENG 102, 105, 108 or 112 with C or better	L
JUS 332 Politics of Energy Policy and Justice	3	F/S**	ENG 102, 105, or 108 with C or better; minimum 24 hours	
POS 300 Contemporary Global Controversies	3	F/S/SS/i		SB + G
PUP 301 Introduction to Urban Planning	3	F/S/SS	ENG 101, 105, or 107 with C or better	L
PUP 442 Environmental Planning	3	F/SS/i	PUP 301 with C or better	
SOC 331 Environmental Sociology	3	S**	Minimum 45 hours	SB + G

Environmental Policy Track (this track has some overlap with the Energy and Sustainability certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
SOS 315 Energy Policy	3	F/S/SS/i	Minimum 45 hours; Credit is allowed for only SGS 315 or SOS 315	
SOS 320 Society and Sustainability	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; ENG 101, 105 or 107	L or SB
SOS 321 Policy and Governance in Sustainable Systems	3	F/S/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 323 Sustainable Urban Dynamics	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 324 Sustainable Energy Technology and Systems	3	F/S/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; Credit is allowed for only EVE 411 or SOS 324	
SOS 444 Climate Change, Society and Sustainability	3			
STP 420 Introductory Applied Statistics	3	F/S/SS/i	MAT 210, 251, 265, or 270 with C or better	CS

Sustainability Track (this track has some overlap with the Energy and Sustainability certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
ABS 350 Applied Statistics	3	F/S/SS	One course meeting General Studies MA requirement with C or better *(Offered at Polytechnic campus only)*	CS
ASB 326 Human Impacts on Ancient Environments	3	F or S**	Minimum 45 hours	SB + H
FIS 444 or JUS 444 Environment and Justice	3	S**	ENG 102, 105, or 108 with C or better; minimum 36 hours; Credit is allowed for only FIS 444 or JUS 444	L + C
GCU 364 Energy in the Global Arena	3	F		SCI SOC
GIS 470 Advanced Statistics for Geography and Planning	3	F/S/i	DAT 300 or GIS 270 with C or better	CS

Sustainability Track (this track has some overlap with the Energy and Sustainability certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
GLG 304 or SOS 373 Minerals, Energy, and Society	3	S	ENG 101, 105 or 107 with C or better; GLG 101, GLG 102, GLG 110, GPH 111, SES 121, or minimum junior standing; Credit is allowed for only GLG 304, GLG 394 (Minerals, Energy & Society) or SOS 373	SCI SOC
GPH 314 Global Change	3	F/S/SS/i	Minimum 45 hours	HU + G SCI SOC
GPH 414 Climate Change	3	F/S/i	GPH 111 or 213 or 314 with C or better	G
HST 345 Environmental History	3	F/S/i	ENG 102, 105, 108 or 112 with C or better	L
JUS 332 Politics of Energy Policy and Justice	3	F/S**	ENG 102, 105, or 108 with C or better; minimum 24 hours	
JUS 456 or SOS 456 Human Rights and Sustainability	3	F**	ENG 102, 105, or 1008 with C or better; minimum 36 credit hours; Credit is allowed for only JUS 456 or JUS 497 (Seminar in Human Rights) or SOC 455 or SOS 456	(L or SB) + G
PUP 442 Environmental Planning	3	F/SS/i	PUP 301 with C or better	
SCN 401 Sustainability Science, Technology, and Society	3	F	Non-Teacher Preparation student; minimum junior standing; Credit is allowed for only SCN 400 or SCN 401	
SOS 300 Advanced Concepts and Integrated Approaches in Sustainability	3	F/S/SS/i	SOS 100, 110, 111 or PUP 190 with C or better; minimum 45 hours	
SOS 310 Equity, Justice and Sustainability	3	F/S/SS/i	PUP 190 or SOS 111 with C or better; SOS 110 with C or better	
SOS 314 Basic Energy Science	3	F/S/SS/i	Minimum 45 hours	SCI SOC
SOS 315 Energy Policy	3	F/S/SS/i	Minimum 45 hours; Credit is allowed for only SGS 315 or SOS 315	
SOS 320 Society and Sustainability	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; ENG 101, 105 or 107	L or SB
SOS 321 Policy and Governance in Sustainable Systems	3	F/S/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 323 Sustainable Urban Dynamics	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 324 Sustainable Energy Technology and Systems	3	F/S/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better; Credit is allowed for only EVE 411 or SOS 324	

Sustainability Track (this track has some overlap with the Energy and Sustainability certificate)				
Class number and title	**Credit Hours**	**When Offered**	**Pre-requisites**	**GS**
SOS 325 The Economics of Sustainability	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 326 Sustainable Ecosystems	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 327 Sustainable Food and Farms	3	F/S/SS/i	Two of following courses: SOS 100, SOS 110, SOS 111 (or PUP 190), SOS 300 with C or better	
SOS 444 Climate Change, Society and Sustainability	3	F/SS/i	minimum 45 hours; Credit is allowed for only SOS 444 or SOS 494 (Social Dimensions of Climate Change) or SOS 544 or SOS 598 (Social Dimensions of Climate Change)	
STP 420 Introductory Applied Statistics	3	F/S/SS/i	MAT 210, 251, 265, or 270 with C or better	CS

LEGEND	
F = Fall	i = may be offered as an iCourse
S = Spring	* Course has a lab component
SS = Summer Session	** Course not offered in a regular pattern