

**BS in Natural Resources, Global Change Ecology and Management option** catalog year 2020-21

**General Education Requirements**

English Composition  
 ENGL 101 and ENGL 102 3\_\_ 3\_\_  
 OR ENGL 106, 107 and 108 3\_\_ 3\_\_ 3\_\_  
 OR ENGL 109H 3

2nd Language  
 (2<sup>nd</sup> semester proficiency by credit or exam; C or better)

**Tier I**

Individuals and Societies: Select 2 courses from 150s

Traditions and Cultures: Select 2 courses from 160s

NOTE: you do not need any 170A, B, C courses

**Tier II**

Art or Humanities

\*Individuals and Societies: ECON 200 suggested

**Diversity requirement:** One general education course must have the non-Western Civilization, Gender, Race, Class, Ethnicity designation. Some Tier 1 and Tier II courses also satisfy this requirement

**Supporting Coursework (22 units)**

Statistics: MATH 163 or 263, OR PSY 230 OR SBS 200 3\_\_ 3\_\_  
 Economics: \*ECON 200 3\_\_  
 \*If you count ECON 200 towards your Tier II Indiv, substitute a technical elective  
 General Chemistry: CHEM 151 AND CHEM 152 4\_\_ 4\_\_  
 General Biology: MCB 181R/L: Intro Biol I 4\_\_  
 ECOL 182R/L: Intro Biol II 4\_\_

**Natural Resources Core Courses (18 units)**

RNR 200: Conservation of Natural Environments (Fall/Sum) 3\_\_  
 RNR 230R/L: Field Botany (Fall) 2\_\_ 1\_\_  
 RNR 316: Natural Resources Ecology (Fall/Sp) 3\_\_  
 RNR 321: Ecological Surveys and Sampling (Fall/Sp) 3\_\_  
 RNR 384: Natural Resources Management Practices (Spring) 3\_\_  
 RNR 480: Natural Resources Policy and Law (Spring) 3\_\_

**Core Themes (13 units) select one course from each area**

Math: MATH 113 OR MATH 122B OR MATH 125 3 or 5\_\_  
 Technical Skills: RNR 403, RNR 417, GEOG 330, 3\_\_  
 RAM 456A, RAM 446  
 Technical Writing: ENGL 308, ENGL 313, ENGL 340, 3\_\_  
 ENGL 414, ENVS 408, ENVS 415  
 Oral or Media Communication: ALC 422, COMM 119, 3\_\_  
 COMM 113, JOUR 455, JOUR 472, RNR 485A, SBE 202, SCI 401 3\_\_  
 SNRE requirement 3\_\_  
 1\_\_

**Option Specific Courses (25 units)**

RNR 101 Global Sustainability and Natural Resources (Fall) 3\_\_  
 RNR 440 Climate Change Adaptation (Fall) 3\_\_  
 RNR 496G Climate Assessment (Spring) 3\_\_  
 RNR 429 Ecological Climatology (Fall) 3\_\_  
 WSM 452 Dryland Ecohydrology (Fall) 4\_\_  
 RNR 458 Ecosystem Ecology (Spring) 3\_\_  
 WSM 460A Watershed Management OR 3\_\_  
 GEOS 478 Global Change  
 Policy, Law, Economics (select 1) 3\_\_  
 AREC 360, AREC 476, AREC 479, RNR 485

**Technical Electives (18 units):**

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**Graduation Requirements:**

- at least 120 units
- at least a 2.0 major and cumulative GPA,
- 42 upper division units
- Mid-career writing assessment fulfilled with a B or higher in English Composition OR with Technical Writing requirement.
- 30 or more units completed at the UA

## Bachelor of Science in Natural Resources: Global Change Ecology & Management

		FALL		SPRING			
Course Title		Units	Prerequisite?	Course Title	Units	Prerequisite?	
<b>Freshman</b>	CHEM 151 OR CHEM 141 and 143	4	MATH 112 or placement	CHEM 152 OR CHEM 142 and 144	4	1st semester CHEM	
	ENGL 101 or 109H	3		ENGL 102 (or 109H)	3		
	RNR 101: Global Sustainability and Natural Resources	3		ECOL 182R and L General Biology Lecture and Lab	4		
	Calculus: MATH 113, 122B, or 125	3	MATH 112 or placement test	Tier 1 Traditions and Cultures	3		
	Tier 1 Individuals and Societies	3		<b>RNR 200 Conservation of Natural Environments</b>	3		
		TOTAL	16			TOTAL	17
<b>Sophomore</b>	ECON 200	3		Tier 2 Individuals and Societies	3		
	Statistics: MATH 163 or 263, or PSY 230, or SBS 200	3	MATH 112 or placement	<b>RNR 321 Ecological Surveys and Sampling</b>	3	statistics	
	<b>RNR 316 Natural Resources Ecology</b>	3	ECOL 182R, ECOL 182L, RNR 230R/L	Tier 1 Traditions and Cultures	3		
	MCB 181L General Biology Lab	1	MATH 112 or placement; CHEM	Tier 1 Individuals and Societies	3		
	MCB 181R General Biology Lecture	3	MATH 112 or placement; CHEM	Technical Elective	3		
		TOTAL	13			TOTAL	15
<b>Junior</b>	Technical Elective	3		Technical electives	3		
	Technical Writing: ENGL 308, 313, 340, 414 or ENVS 408, 415	3		Oral or Media Communication: ALC 422, COMM 113, COMM 119, JOUR 455, JOUR 472, SBE 202, SCI 401, RNR 495A	3		
	<b>RNR 230R and 230L Field Botany</b>	3		<b>RNR 384 Natural Resources Management Practices</b>	3		
	Tier 2 Arts or Humanities Elect.	3		RNR 458 Ecosystem Ecology	3		
	RNR 429 Ecological Climatology	3		Technical Skills: RNR 403, 417 or GEOG 330 or RAM 446 or 456A	3		
		TOTAL	15			TOTAL	15
<b>Senior</b>	RNR 440 Climate Change Adaptation	3	<b>Seniors only</b>	RNR 496G - Climate Assessment	3		
	WSM 452 Dryland Ecohydrology	4	One year of general biology	Policy, Law, and Economics Elective: AREC 360 , 476 or 479; RNR 485	3	ECON 200/MATH 112	
	WSM 460A Watershed Hydrology or GEOS 478 Global Change	3 to 4		Technical Electives	6		
	Technical electives	3		<b>RNR 480 Natural Resources Policy and Law</b>	3	RNR 200	
	SNRE Requirement	1					
		TOTAL	14 to 15			TOTAL	15

Diversity Emphasis: One general education course must have the non-Western Civilization, Gender, Race, Class, Ethnicity designation  
 2nd semester language proficiency required-- not included in this plan

## **GLOBAL CHANGE ECOLOGY & MANAGEMENT OPTION**

### **Technical Electives**

GCEM students take a minimum of 18 units in any of the following areas

#### **Earth Systems and Global Change**

ATMO 336 Weather climate and society  
ATMO 421C Physical climatology: mechanisms of change  
ATMO 436A Fundamentals of atmospheric sciences  
GEOG 304 Water environment and society  
GEOG 431 Global and regional climatology  
GEOS 212 Intro to oceanography  
GEOS 220 Environmental History of the Southwest  
GEOS 308 Paleontology  
GEOS 412A Ocean sciences  
GEOS 482 Paleoclimatology  
RNR 355 Wildland Fire  
ENVS 200/201 Soils w/ lab  
ENVS 461 Soil & water conservation  
WSM 468 Wildland water quality

#### **Biological systems**

PLS 312 Genetics  
ECOL 335 Evolutionary biology  
ECOL 406R Conservation biology  
ECOL 426 Population genetics  
ECOL 496J Plant population ecology  
ECOL 496R Species diversity  
ENVS 300 Soil Ecology and Sustainable Systems  
GEOG 348 Biogeography  
RAM 382 Rangeland plant communities  
PL S 240 Plant biology  
PL S 360 Principles of plant physiology  
PL S 440 Plant growth & development  
WFSC 471 Stream ecology

#### **Human Systems**

AREC 217 Resource and Environmental economics  
GEOG 305 Economic geography  
GEOG 371 Principles and practices of regional development  
GEOG 379 Urban growth and development  
GEOG 380 Global agricultural and international relations  
GEOG 404 Politics of nature  
ENVS 310 Ecosystem Health and Justice  
PA 461 Global climate change science and policy  
RNR 256 Sustainable cities and societies  
RNR 340 Conservation and Agriculture in the SW  
RNR 481 Environmental policy  
RNR 495F Conservation biology in developing countries

#### **Management**

GEOG 301 Intro to regional planning  
GEOG 379 Urban Growth and Development  
GEOG 408 Arizona and the Southwest  
RAM 436A Grazing ecology and management  
RAM 446 Management and Restoration of Wildland Vegetation  
RNR 496E Restoration ecology  
ENVS 401 Sustainable management of arid lands  
ENVS 454 Water harvesting  
WS M 462 Watershed management  
WFSC 444 Wildlife Management  
WFSC 455R Fishery Management

#### **Additional Electives**

GEOS 497C Introduction to dendrochronology  
WFSC 223 Dealing with Data in the Wild  
RNR 322 Field Methods in Nat Res  
RNR 419 Cartographic modeling

RNR 473 Spatial analysis  
RNR 483 Geography applications of remote sensing  
RNR 490 Remote sensing for the study of planet earth  
WS M 497C/I Dendrochronology and dendroclimatology  
RNR 492 Directed Research  
RNR 493 Internship  
RNR 499 Independent Study

#### **Consider an Undergraduate Certificate in:**

- Rangeland Management
- Geographic Information Systems
- Zoo and Aquarium Conservation
- International Environmental Conservation