

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

		FALL		SPRING		
	Course Title	Units	Prerequisite?	Course Title	Units	Prerequisite?
Freshman	Tier 1 Nat Sci – CHEM 151	4	MATH 112 or placement	Tier 1 Nat Sci – CHEM 152	4	CHEM 151
	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	
	MATH 113, 122A/B, or 125 (Calculus)	3-5	MATH 112 or placement test	Tier 1 Traditions and Cultures	3	
				Tier 1 Individuals and Societies	3	
	TOTAL	13/15		TOTAL	17	
Sophomore	Tier 2 Ind & Soc – ECON 201a or ECON 200	3		Tier 1 Individuals and Societies	3	
	MATH 163 or 263 (Statistics)	3	MATH 112 or placement	Tier 2 Arts or Humanities Elect.	3	
	RNR 230R and 230L Field Botany	3		ENGL 308, 313, or 414, ENVS 415, or AGTM 422	3	
	Phys 102	3	MATH 112 or placement/none	RNR 384 Natural Resources Management Practices	3	
	MCB 181L General Biology Lab	1	MATH 112 or placement; CHEM 151	Technical Elective	3	
	MCB 181R General Biology Lecture	3	MATH 112 or placement; CHEM 151			
		TOTAL	16		TOTAL	15
Junior	RNR 316 Natural Resources Ecology	3	ECOL 182R, ECOL 182L, RNR 230R/L	Human Systems Elective: see list	3	
	Tier 1 Traditions and Cultures	3		Earth Systems and Global Change Elective: see list	3	
	RNR 200 Conservation of Natural Environments	3		RNR 321 Natural Resources Measurements	3	MATH 163 or 263
	RNR 351 Ecosystem Services: Science and Management	3	MCB 181R, ECOL182R; RNR 200 and RNR 316 recommended	Management Elective: see list	3	
	Skills and Tools Elective: see list	3		Technical elective	3	
	TOTAL	15		TOTAL	15	
Senior	Biological Systems Elective: see list	3	GEOG 430 The Climate System	Policy, Law, and Economics Elective: AREC 350 , AREC 479	3	ECON 200 or 201A/MATH 112
	Environment Elective: RNR 452 Dryland Ecohydrology (Fall) or RNR 458 Ecosystem Ecology (Spring)	4	One year of general biology	RNR 440 Climate Change Adaptation (even year Spring)	3	Seniors only
	GEOS 478 Global Change Ecology	3	junior/senior; intro bio/chem/phys	GEOG 430 The Climate System	3	
	Technical electives	7		RNR 480 Natural Resources Policy and Law	3	RNR 200
		TOTAL	16		TOTAL	13

10 units of Technical Electives to reach 120 units required
 One general education course must have the non-Western Civilization, Gender, Race, Class, Ethnicity designation
 2nd semester language proficiency required

GLOBAL CHANGE ECOLOGY & MANAGEMENT OPTION
Major: Natural Resources
Technical Electives

GCEM students take a minimum of one class in each of five areas: skills and tools, Earth systems and global change, biological systems, human systems, and management.

Skills and Tools

ECOL 380 Math models in biology
GEOG 457 Statistical techniques in geography and regional level
GEOS 497C Introduction to dendrochronology
RNR 403 Applications of GIS
RNR 417 GIS for natural & social sciences
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
SCI 401 Science Communication
WS M 330 Remote Sensing
WS M 497C/I Dendrochronology and dendroclimatology

Earth Systems and Global Change

ATMO 170 Intro to Weather and Climate
ATMO 171 Intro to Meteorology and Climatology
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 402 Air & water
WSM 468 Wildland water quality

Biological systems

ECOL 320 Genetics
ECOL 335 Evolutionary biology
ECOL 406R Conservation biology
ECOL 426 Population genetics
ECOL 496J Plant population ecology
ECOL 496R Species diversity
GEOG 303 Field study in envl geography
GEOG 438 Biogeography
RAM 382 Rangeland plant communities
PL S 240 Plant biology
PL S 360 Principles of plant physiology
PL S 440 Plant growth & development
RNR 458 Ecosystem ecology and a Sustainable Future
WFSC 471 Stream ecology

Human Systems

AREC 195B Global poverty and hunger
AREC 217 Resource and Environmental economics
AREC 476 Envl law and economics
AREC 478 Economics of the natural environment
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
HWR 415 Intro to water resources policy
PA 461 Global climate change science and policy
RNR 256 Sustainable cities and societies

RNR 476 Envl law and economics
RNR 481 Environmental policy
RNR 495F Conservation biology in developing countries
WSM 444 Applied environmental law

Management

AREC 350 Economics, ethics and environmental 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 seminar
ENVS 401 Sustainable management of arid lands
ENVS 454 Water harvesting
WS M 438 Fire Ecology
WS M 462 Watershed management