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

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
<th>Prerequisite?</th>
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<tbody>
<tr>
<td>Tier 1 Nat Sci - CHEM 151</td>
<td>4</td>
<td>MATH 112 or placement</td>
<td>Tier 1 Nat Sci - CHEM 152</td>
<td>4</td>
<td>CHEM 151</td>
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<tr>
<td>ENGL 101 or 109H</td>
<td>3</td>
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<td>ENGL 102 (or 109H)</td>
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<tr>
<td>RNR 101: Global Sustainability and Natural Resources</td>
<td>3</td>
<td></td>
<td>ECOL 182R and L General Biology Lecture and Lab</td>
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<td>MATH 113, 122A/B, or 125 (Calculus)</td>
<td>3-5</td>
<td>MATH 112 or placement test</td>
<td>Tier 1 Traditions and Cultures</td>
<td>3</td>
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<tr>
<td>ENGL 101 or 109H</td>
<td>3</td>
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<td>Tier 1 Individuals and Societies</td>
<td>3</td>
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<td>TOTAL 13/15</td>
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<td>TOTAL 17</td>
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| 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, ENV 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 | Technical Elective                              | 3     |                                |
| TOTAL 16                                         |       |                                | TOTAL 15                                        |       |                                |

| 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                                        |       |                                |

| 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
Revised Oct 2015
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 development
- 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
- WSM 330 Remote Sensing
- WSM 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

### 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
- WSM 438 Fire Ecology
- WSM 462 Watershed management

30 October 2015, v10