Rangeland Ecology and Management - BS, Ranch Management Option

Students majoring in Rangeland Ecology and Management are taught to integrate knowledge and technology in a systems approach to manage land for sustainable utilization of natural resources. Emphasis is placed on conservation and maintenance of biological diversity in wet to arid environments and sustainable production, conservation and function of land. Rangelands comprise approximately 50% of the land area of the United States and the world. Natural resources on rangelands provide many products and values for society including: livestock grazing, habitat for game and non-game wildlife, water for urban and agricultural uses, recreational opportunities, minerals, oil and gas. The expansiveness and diversity of rangelands require that knowledge and technology be drawn from numerous disciplines.

Employment opportunities are diverse. They include all aspects of natural resource management, including ranch management, environmental consulting, conservation and natural resource planning on private lands and with state and federal agencies. Students also find employment in agribusiness sales, marketing, agricultural finance real estate, consulting and reclamation. Students can also pursue professional careers in teaching agricultural science.

Two options in the Rangeland Ecology and Management curriculum provide the opportunity for specialization in a minor field.

Ranch Management Option

Designed for students preparing for careers in ranch management and agribusiness. This option emphasizes management and utilization of rangeland for livestock and wildlife production. It provides excellent preparation for students desiring to obtain a Master of Agriculture degree in ranch management. Employment opportunities are available on private ranches, businesses, and industries supporting ranches and with state and federal agencies.

Emphasis Areas

Ecology

Designed for students to explore and specialize in a diverse array of ecological topics. They study plants and animals and the ecological principles essential for effective conservation, management and restoration of the land and associated natural resources. They are prepared for careers in resource monitoring, management and conservation with state and federal agencies and the private sector.

Environmental Science

Designed for students preparing for professional careers in environmental management. The coursework includes a basic foundation of ecological sciences, plant taxonomy and rangeland management with emphasis on plants, water and soils. Job opportunities are available in environmental consulting firms, public utility companies, municipalities and federal environmental agencies. The curriculum provides a good foundation for students planning to pursue graduate studies in watershed management, environmental sciences, pollution control or waste management.

Preveterinary Medicine

Prepares students for admission to the professional program in veterinary medicine. Students planning to work in large animal practice would benefit from studies in rangeland ecology and management.

Range/Soil Conservation

Designed to qualify students as range management specialists or soil conservationists with the federal government. The curriculum will provide students with competitive ratings with federal Civil Service for positions with the Natural Resources Conservation Service, Forest Service and Bureau of Land Management. Various electives and work experience may be used to increase the rating score. Job opportunities are also available in private and state organizations.

Teaching

For students preparing in rangeland ecology and management who wish to teach. Directed electives may be chosen so that, following this curriculum, the student is eligible to enter the induction year as a teacher of agricultural science under the Texas Education Agency Plan. Off-campus student teaching is required.

Watershed Resources

For students preparing for a professional career in watershed management. Graduates qualify for employment as range management specialists and soil conservationists or, with proper selection of electives, as hydrologists. Opportunities are also available in environmental consulting firms, public utility companies, land reclamation firms, municipalities, secondary school education and private land management.

Program Requirements

Ecosystem Science and Management Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 350</td>
<td>Environmental and Natural Resource Economics</td>
<td>3</td>
</tr>
<tr>
<td>or AGEC 325</td>
<td>or Principles of Farm and Ranch Management</td>
<td></td>
</tr>
<tr>
<td>ESSM 201</td>
<td>Exploring Ecosystem Science and Management</td>
<td>1</td>
</tr>
<tr>
<td>ESSM 301</td>
<td>Wildland Watershed Management</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 302</td>
<td>Wildland Plants of North America</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 306</td>
<td>Plant Functional Ecology and Adaptation</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 311</td>
<td>Biogeochemistry and Global Change</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 313</td>
<td>Vegetation Sampling Methods and Designs in Ecosystems</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 318</td>
<td>Coupled Social and Ecological Systems</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 320</td>
<td>Ecosystem Restoration and Management</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 351</td>
<td>Geographic Information Systems for Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 406</td>
<td>Natural Resources Policy</td>
<td>3</td>
</tr>
<tr>
<td>or RNR 470</td>
<td>or Environmental Impact Assessment</td>
<td></td>
</tr>
<tr>
<td>ESSM 481</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>RNR 205</td>
<td>Fundamentals of Ecology</td>
<td>3</td>
</tr>
<tr>
<td>SCSC 301</td>
<td>Soil Science</td>
<td>4</td>
</tr>
</tbody>
</table>

Rangeland Ecology and Management Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 350</td>
<td>Environmental and Natural Resource Economics</td>
<td>3</td>
</tr>
<tr>
<td>or AGEC 325</td>
<td>or Principles of Farm and Ranch Management</td>
<td></td>
</tr>
<tr>
<td>ESSM 201</td>
<td>Exploring Ecosystem Science and Management</td>
<td>1</td>
</tr>
<tr>
<td>ESSM 301</td>
<td>Wildland Watershed Management</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 302</td>
<td>Wildland Plants of North America</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 306</td>
<td>Plant Functional Ecology and Adaptation</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 311</td>
<td>Biogeochemistry and Global Change</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 313</td>
<td>Vegetation Sampling Methods and Designs in Ecosystems</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 318</td>
<td>Coupled Social and Ecological Systems</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 320</td>
<td>Ecosystem Restoration and Management</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 351</td>
<td>Geographic Information Systems for Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>ESSM 406</td>
<td>Natural Resources Policy</td>
<td>3</td>
</tr>
<tr>
<td>or RNR 470</td>
<td>or Environmental Impact Assessment</td>
<td></td>
</tr>
<tr>
<td>ESSM 481</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>RNR 205</td>
<td>Fundamentals of Ecology</td>
<td>3</td>
</tr>
<tr>
<td>SCSC 301</td>
<td>Soil Science</td>
<td>4</td>
</tr>
</tbody>
</table>
ESSM 314  Principles of Rangeland Management Around the World  3
ESSM 315  Rangeland Inventory and Monitoring  1
ESSM 316  Range Ecology  3
ESSM 317  Vegetation Management  3
ESSM 415  Range Analysis and Management Planning  4
or RENR 410 or Ecosystem Management

**Ranch Management Option**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC 107</td>
<td>General Animal Science</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 108</td>
<td>General Animal Science</td>
<td>1</td>
</tr>
<tr>
<td>ANSC 302</td>
<td>Basic Beef Cattle Production</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 320</td>
<td>Animal Nutrition and Feeding</td>
<td>3</td>
</tr>
<tr>
<td>Directed electives</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

**Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>
| University Core Curriculum
| AGEC 105     | Introduction to Agricultural Economics       | 3       |
| BIOL 101     | Botany                                        | 4       |
| or BIOL 113  | or Essentials in Biology                      |         |
| CHEM 101     | Fundamentals of Chemistry I                  | 4       |
| & CHEM 111   | and Fundamentals of Chemistry Laboratory I   |         |
| RENR 215     | Fundamentals of Ecology--Laboratory          | 1       |
| American history electives  |                                               | 6       |
| Communication electives  |                                               | 6       |
| Creative arts elective  |                                               | 3       |
| Government/Political science electives  |                                               | 6       |
| Language, philosophy and culture elective  |                                               | 3       |
| Mathematics electives (MATH prefix required) |                                               |         |

**Total Semester Credit Hours**  120

1  Students must take this course for the Ranch Management Option.
2  To be selected in consultation with an advisor.
3  The Graduation requirements include a requirement for 6 hours of international and cultural diversity courses. A course satisfying a Core category, a college/department requirement, or a free elective can be used to satisfy this requirement. See academic advisor.
4  Credit by examination may be used to substitute for 3 hours of POLS 206 or POLS 207.