# SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

# New Specialization

| | |
|---|---|
| **UNIVERSITY:** | **SDSU** |
| **TITLE OF PROPOSED SPECIALIZATION:** | **Rangeland Ecology and Management** |
| **NAME OF DEGREE PROGRAM IN WHICH SPECIALIZATION IS OFFERED:** | **Ecology and Environmental Science (B.S.)** |
| **INTENDED DATE OF IMPLEMENTATION:** | **2019-2020 Academic Year** |
| **PROPOSED CIP CODE:** | **03.0104** |
| **UNIVERSITY DEPARTMENT:** | **Natural Resource Management** |
| **UNIVERSITY DIVISION:** | **Agriculture, Food & Environmental Sciences** |

**University Approval**

*To the Board of Regents and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.*

Barry H. Dunn

Institutional Approval Signature
*President or Chief Academic Officer of the University*

5/13/2019
Date

**1. Level of the Specialization:**

Baccalaureate ☒ Master's ☐ Doctoral ☐

**2. What is the nature/purpose of the proposed specialization?**

South Dakota State University (SDSU) requests authorization to offer a Rangeland Ecology and Management Specialization in the B.S. of Ecology and Environmental Science. SDSU currently offers a B.S. in Rangeland Ecology and Management. The major will be terminated with approval of this new specialization. The Ecology and Environmental Science (B.S.) – Rangeland Ecology and Management Specialization will be offered through the College of Agriculture, Food and Environmental Sciences.

Rangeland Ecology and Management is an applied field of ecology concerned with the application of rangeland management practices for the preservation and enhancement of ecosystem goods and services offered on working rangelands. The Rangeland Ecology and Management Specialization will share the same core courses as the Ecology and Environmental Science major core requirements (48-49 credits) and System General Education Requirements (SGR) with exceptions under SGR Goal #3. The core will prepare the students to think critically, analyze data, and address ecology and environmental issues on a local and regional scale. The strong foundation of the Rangeland Ecology and Management

Specialization is in high demand in today's natural resource management job market. Combining the Rangeland Ecology and Management Specialization with the Ecology and Environmental Science core courses will prepare students for a more diverse job potential and strengthen the enrollment numbers in this field.

The University does not request new state resources.

**3. Provide a justification for the specialization, including the potential benefits to students and potential workforce demand for those who graduate with the credential.[1]**

Rangelands provide a myriad of ecosystem goods and services which benefit society. Most notably is forage for livestock production, habitat for wildlife, water recharge of wetlands, lakes, rivers, and streams, soil stabilization, carbon sequestration, and open space for aesthetic value. The U.S. has approximately 770 million acres of rangeland, 130 million acres of pastureland, and 39 million acres of hayland.[2] [3] These lands, for the most part, are unsuitable for crop production because of steep slopes, poor soils, and low rainfall (especially western US).

South Dakota State University offers an accredited (by the Society for Range Management) Rangeland Ecology and Management Program. Currently there are 12 accredited programs in the US and 41 institutions offering degrees or classes in rangeland management.[4] Moving the degree program to a specialization will not negatively impact SDSU's accredited Rangeland Ecology and Management program.

US estimates of the total number of students graduating with a degree in Rangeland Ecology and Management are less than 200/year.[5] Students graduating with the degree credentials qualify for a rangeland management specialist federal series (GS-0454) with the US Department of Interior Bureau of Land Management, US Department of Agriculture Forest Service, US Department of Agriculture Natural Resources Conservation Service, and US Department of Interior Bureau of Indian Affairs. According to the US Department of Labor Bureau of Labor Statistics (2019), the number of conservation scientist jobs in the US was 34,600, will grow at 6% (2016-2026), and had a median pay of $61,120/year in 2017.[6] In addition to the federal positions, there are state and local government entities, non-governmental organizations, and consulting companies that higher students with Rangeland Ecology and Management degree credentials that widen the job field.

**4. List the proposed curriculum for the specialization (including the requirements for completing the major – *highlight courses in the specialization*):**

[1] For workforce related information, please provide data and examples; data sources may include but are not limited to the South Dakota Department of Labor, the US Bureau of Labor Statistics, Regental system dashboards, etc.
[2] USDA-FS. 2018. About Rangeland Management. USDA Forest Service. Available online at: https://www.fs.fed.us/rangeland-management/aboutus/index.shtml. Accessed March 5, 2019.
[3] USDA-NRCS. 2003. National Range and Pasture Handbook. Chapter 2. Available online at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1043059.pdf. Accessed March 5, 2019.
[4] SRM. 2019. Universities and Colleges. Available online at: http://rangelands.org/srm-academic-resources/universities-colleges/. Accessed March 5, 2019.
[5] RSEC. 2019. Range Science Education Council Rangeland Programs Database. Available online at: https://rangesec.org/. Accessed March 5, 2019.
[6] US Department of Labor. 2019. Occupational Outlook Handbook: Conservation Scientists and Foresters. Bureau of Labor Statistics. Available online at: https://www.bls.gov/ooh/life-physical-and-social-science/conservation-scientists.htm. Accessed March 5, 2019.

| Ecology and Environmental Science (B.S.) – Rangeland Ecology and Management Specialization | Credit Hours | Credit Hours | Percent |
|---|---|---|---|
| System General Education Requirements | 32 | | |
| Subtotal, Degree Requirements | | 32 | 27% |
| College of Agriculture, Food & Environmental Sciences Requirements* | | 0 | 0% |
| Major Requirements | 38-40 | | |
| Ecology and Environmental Science – Rangeland Ecology and Management Specialization Requirements | 16 | | |
| Required Support Courses | 22 | | |
| Subtotal, Program Requirements | | 76-78 | 63-65% |
| General Electives | | 10-12 | 8-10% |
| Degree Total[7] | | 120 | 100% |

*These credits are counted in the major requirements, specialization requirements, and supporting courses.

**System General Education Requirements**

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| ENGL | 101 | Composition I (SGR #1) | 3 | No |
| ENGL | 201 | Composition II (SGR #1) | 3 | No |
| SPCM | 101 | Fundamentals of Speech (SGR #2) | 3 | No |
| ECON | 201 | Principles of Microeconomics (SGR #3) | 3 | No |
| SOC<br>OR<br>SOC<br>OR<br>SOC | 100<br><br>150<br><br>240 | Introduction to Sociology (3) (SGR #3)<br><br>Social Problems (3) (SGR #3)<br><br>The Sociology of Rural Life (3) (SGR #3) | 3 | No |
| | | Student Choice (SGR #4) | 3 | No |
| | | Student Choice (SGR #4) | 3 | No |
| MATH | 114 | College Algebra (SGR #5) (or higher) | 3 | No |
| BIOL | 151-151L | General Biology I and Lab (SGR #6) | 4 | No |
| CHEM<br>OR<br>CHEM | 106-106L<br><br>112-112L | Chemistry Survey and Lab (4) (SGR #6)<br><br>General Chemistry I and Lab (4) (SGR #6) | 4 | No |
| | | Subtotal | 32 | |

**College of Agriculture, Food and Environmental Sciences Requirements**

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| | | Students who wish to complete a Bachelor of Science in Agriculture, Food and Environmental Sciences must complete a minimum of 11 credits from the approved list of Group 1 courses. Some departments require specific courses from the | | No |

[2]Board Policy 2:29 requires each baccalaureate level degree program to require 120 credit hours and each associate degree program to require 60 credit hours. Exceptions to this policy require documentation that programs must comply with specific standards established by external accreditation, licensure, or regulatory bodies or for other compelling reasons and must receive approval by the Executive Director in consultation the President of the Board of Regents.

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| | | list, whereas others leave the selection entirely to the student and the advisor.<br><br>*System General Education Requirements and/or major coursework may satisfy some or all of the above requirements. Please review major requirements and the Group 1 list to determine if additional courses are required. | | |
| ABS | 475-475L | Integrated Natural Resource Management and Lab *(Major Requirement)* | - | No |
| NRM | 282-282L | Natural Resource Statistics and Lab *(Major Requirement)* | - | No |
| PS | 213-213L | Soils and Lab *(Major Requirement)* | - | No |
| RANG | 205 | Introduction to Range Management *(Major Requirement)* | - | No |
| | | Subtotal* | - | |

**Major Requirements**

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| ABS | 475-475L | Integrated Natural Resource Management and Lab | 3 | No |
| BIOL<br>OR<br>BOT<br>OR<br>NRM | 153-153L<br><br>201-201L<br><br>200-200L | General Biology II and Lab (4) (SGR #6)<br><br>General Botany and Lab (3) (SGR #6)<br><br>Animal Diversity and Lab (3) | 3-4 | No |
| CHEM<br>OR<br>CHEM | 108-108L<br><br>114-114L | Organic and Biochemistry and Lab (5) (SGR #6)<br><br>General Chemistry II and Lab (4) (SGR #6) | 4-5 | No |
| EES | 425-425L | Disturbance and Restoration Ecology and Lab | 3 | No |
| EES<br>OR<br>EES<br>OR<br>EES<br>OR<br>EES | 491<br><br>494<br><br>496<br><br>498 | Independent Study (1)<br><br>Internship (1)<br><br>Field Experience (1)<br><br>Undergraduate Research (1) | 1 | No |
| GEOG | 372-372L | Introduction to GIS and Lab | 3 | No |
| NRM | 119 | Orientation to Natural Resource Management | 2 | No |
| NRM | 230 | Natural Resource Management Techniques | 3 | No |
| NRM | 282-282L | Natural Resource Statistics and Lab | 3 | No |
| NRM | 300 | Laws and Policies in NRM | 3 | No |
| NRM | 311 | Principles of Ecology | 3 | No |
| NRM | 311L | Principles of Ecology Lab | 1 | No |
| PHYS<br>OR | 101-101L | Survey of Physics and Lab (4) (SGR #6) | 4 | No |

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| PHYS | 111-111L | Introduction to Physics I and Lab (4) (SGR #6) | | |
| PS | 213-213L | Soils and Lab | 3 | No |
| | | Subtotal | 38-40 | |

**Ecology and Environmental Science – Rangeland Ecology and Management Specialization Requirements**

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| RANG | 205 | Introduction to Range Management | 3 | No |
| RANG | 210-210L | Range Plant Identification and Lab | 2 | No |
| RANG | 215 | Intro to Int. Ranch Management | 3 | No |
| RANG | 374-374L | Habitat Conservation and Management | 3 | No |
| RANG | 400 | Range Judging (take up to 2 credits | 2 | No |
| RANG | 425-425L | Range Assessment and Monitoring and Lab | 3 | No |
| | | Subtotal | 16 | |

**Supporting Coursework**

| Prefix | Number | Course Title | Credit Hours | New (yes, no) |
|---|---|---|---|---|
| AS | 101-101L | Introduction Animal Science and Lab | 4 | No |
| AS | 218 | Survey of Nutrition | 3 | No |
| BOT | 301-301L | Plant Systematics | 3 | No |
| PRAG<br>OR<br>PS | 410-410L<br><br>462 | Soil Geography and Land Use Interpretation and Lab (3)<br>Environmental Soil Management and Lab (3) | 3 | No |
| RANG<br>OR<br>RANG | 321<br><br>421 | Wildland Ecosystems (3)<br><br>Grassland Fire Ecology (3) | 3 | No |
| | | | | |
| | | Resource Management Coursework<br>Select 6 credits from the following list: | 6 | |
| AGEC | 271 | Farm and Ranch Management (3) | | No |
| BOT | 303-303L | Forest Ecology and Management and Lab (3) | | No |
| PS | 313-313L | Forage Crop and Pasture Management (3) | | No |
| WL | 220 | Intro Wildlife and Fisheries Management (3) | | No |
| | | Subtotal | 22 | |

| | |
|---|---|
| Total number of hours required for completion of specialization | 38 |
| Total number of hours required for completion of major | 76-78 |
| Total number of hours required for completion of degree | 120 |

## 5. Delivery Location[8]

**A. Complete the following charts to indicate if the university seeks authorization to deliver the entire program on campus, at any off campus location (e.g., UC Sioux Falls, Capital**

[8] The Higher Learning Commission (HLC) and Board of Regents policy requires approval for a university to offer programs off-campus and through distance delivery.

**University Center, Black Hills State University-Rapid City, etc.) or deliver the entire program through distance technology (e.g., as an on-line program)?**

| | **Yes/No** | ***Intended Start Date*** |
|---|---|---|
| **On campus** | Yes | **2019-2020 Academic Year** |

| | **Yes/No** | ***If Yes, list location(s)*** | ***Intended Start Date*** |
|---|---|---|---|
| **Off campus** | No | | |

| | **Yes/No** | ***If Yes, identify delivery methods***[9] | ***Intended Start Date*** |
|---|---|---|---|
| **Distance Delivery (online/other distance delivery methods)** | No | | |

**B. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the certificate through distance learning (e.g., as an on-line program)?** [10]

| | **Yes/No** | ***If Yes, identify delivery methods*** | ***Intended Start Date*** |
|---|---|---|---|
| **Distance Delivery (online/other distance delivery methods)** | No | | |

[9] Delivery methods are defined in AAC Guideline 5.5.

[10] This question responds to HLC definitions for distance delivery.