



**SOUTH DAKOTA BOARD OF REGENTS  
ACADEMIC AFFAIRS FORMS**

**Substantive Program Modification Form**

<b>UNIVERSITY:</b>	<b>SDSU</b>
<b>CURRENT PROGRAM TITLE:</b>	<b>Ecology and Environmental Science (B.S.)</b>
<b>CIP CODE:</b>	<b>03.0104</b>
<b>UNIVERSITY DEPARTMENT:</b>	<b>Natural Resource Management</b>
<b>UNIVERSITY DIVISION:</b>	<b>Agriculture, Food &amp; Environmental Science</b>

**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.*

Dennis D. Hedge

4/27/2019

Vice President of Academic Affairs or  
President of the University

Date

**1. This modification addresses a change in:**

- |                                                                                  |                                                                  |
|----------------------------------------------------------------------------------|------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Total credits required within the discipline | <input type="checkbox"/> Total credits of supportive course work |
| <input checked="" type="checkbox"/> Total credits of elective course work        | <input type="checkbox"/> Total credits required for program      |
| <input type="checkbox"/> Program name                                            | <input type="checkbox"/> Existing specialization                 |
| <input type="checkbox"/> CIP Code                                                | <input type="checkbox"/> Other (explain below)                   |

**2. Effective date of change:** 2019-2020 Academic Year

**3. Program Degree Level:** Associate  Bachelor's  Master's  Doctoral

**4. Category:** Certificate  Specialization  Minor  Major

**5. If a name change is proposed, the change will occur:**

- On the effective date for all students
- On the effective date for students new to the program (enrolled students will graduate from existing program)

Proposed new name:

**6. Primary Aspects of the Modification:**

*Existing Curriculum*

*Proposed Curriculum (Highlight Changes)*

Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
<b>System General Education Requirements</b>				<b>System General Education Requirements</b>			
	<b>32-34</b>				<b>32-34</b>		
	6	SGR 1 Written Communication ENGL 101 Composition I (3) ENGL 201 Composition II (3)			6	SGR 1 Written Communication ENGL 101 Composition I (3) ENGL 201 Composition II (3)	
	3	SGR 2 Oral Communication SPCM 101 Fundamentals of Speech			3	SGR 2 Oral Communication SPCM 101 Fundamentals of Speech	
	6	SGR 3 Social Sciences/Diversity			6	SGR 3 Social Sciences/Diversity	
	6	SGR 4 Arts and Humanities/Diversity			6	SGR 4 Arts and Humanities/Diversity	
	3-5	SGR 5 Mathematics MATH 102 College Algebra (3) OR MATH 115 Precalculus (5)			3-5	SGR 5 Mathematics MATH <b>114</b> College Algebra (3) OR MATH 115 Precalculus (5)	

## Existing Curriculum

## Proposed Curriculum (Highlight Changes)

Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
OR				OR			
		MATH 121-121L Survey of Calculus (5)				MATH 121-121L Survey of Calculus (5)	
OR				OR			
		MATH 123 Calculus I (4)				MATH 123 Calculus I (4)	
		SGR 6 Natural Sciences	8			SGR 6 Natural Sciences	8
		BIOL 151-151L General Biology I & Lab (4)				BIOL 151-151L General Biology I & Lab (4)	
		AND				AND	
		CHEM 106-106L Chemistry Survey & Lab (4)				CHEM 106-106L Chemistry Survey & Lab (4)	
OR				OR			
		CHEM 112-112L General Chemistry & Lab (4)				CHEM 112-112L General Chemistry & Lab (4)	
<b>College Requirements</b>			<b>0</b>	<b>College Requirements</b>			<b>0</b>
Students seeking the Bachelor of Science degree must complete the System General Education Requirements. In some majors, the student must select a "specialization." Additional requirements for both Bachelor of Science degrees follow.				Students seeking the Bachelor of Science degree must complete the System General Education Requirements. In some majors, the student must select a "specialization." Additional requirements for both Bachelor of Science degrees follow.			
1. The requirements of one of the College's majors must be met. Specific requirements are listed under each program of study.				3. The requirements of one of the College's majors must be met. Specific requirements are listed under each program of study.			
2. 25 semester credits must be upper division (300 and above), with the exception that MATH 125 and 225, Calculus II and III, may be counted as five credits toward the total.				4. 25 semester credits must be upper division (300 and above), with the exception that MATH 125 and 225, Calculus II and III, may be counted as five credits toward the total.			
<b>Bachelor of Science in Agriculture, Food and Environmental Sciences</b>				<b>Bachelor of Science in Agriculture, Food and Environmental Sciences</b>			
Students must complete a minimum of 11 credits from the approved list of Group 1 courses in Agriculture, Food and Environmental Science. Some departments require specific courses from the list, whereas others leave the selection entirely to the student and the advisor.				Students must complete a minimum of 11 credits from the approved list of Group 1 courses in Agriculture, Food and Environmental Science. Some departments require specific courses from the list, whereas others leave the selection entirely to the student and the advisor.			
<ul style="list-style-type: none"> <li>• ABS 475-475L Integrated Natural Resource Management &amp; Lab (3) (Major Requirement)</li> <li>• EES 275 Introduction to Environmental Science (3) (Major Requirement)</li> <li>• NRM 110 Introduction to Natural Resource Management (3) (Major Requirement)</li> <li>• NRM 282-282L Natural Resource Statistics &amp; Lab (3) (Major Requirement)</li> </ul>				<ul style="list-style-type: none"> <li>• ABS 475-475L Integrated Natural Resource Management &amp; Lab (3) (Major Requirement)</li> <li>• EES 275 Introduction to Environmental Science (3) (Major Requirement)</li> <li>• <del>NRM 110 Introduction to Natural Resource Management (3) (Major Requirement)</del></li> <li>• NRM 282-282L Natural Resource Statistics &amp; Lab (3) (Major Requirement)</li> <li>• PS 213-213L Soils and Lab (3)</li> </ul>			
<b>Major Requirements</b>			<b>78-81</b>	<b>Major Requirements</b>			<b>75-78</b>
Major Core			53-56	Major Core			38-40
ABS	475-475L	Integrated Natural Resource Management & Lab	3	ABS	475-475L	Integrated Natural Resource Management & Lab	3
BIOL	153-153L	General Biology II & Lab (4)	3-4	BIOL	153-153L	General Biology II & Lab (4)	3-4
OR				OR			
BOT	201-201L	General Botany I & Lab (3)		BOT	201-201L	General Botany I & Lab (3)	
OR				OR			
NRM	200-200L	Animal Diversity & Lab (3)		NRM	200-200L	Animal Diversity & Lab (3)	
CHEM	108-108L	Organic and Biochemistry & Lab (5)	4-5	CHEM	108-108L	Organic and Biochemistry & Lab (5)	4-5
OR				OR			
CHEM	114-114L	General Chemistry II & Lab (4)		CHEM	114-114L	General Chemistry II & Lab (4)	
EES	275	Introduction to Environmental Science	3	EES	275	Introduction to Environmental Science	3
EES	425-425L	Disturbance & Restoration Ecology & Lab	3	EES	425-425L	Disturbance & Restoration Ecology & Lab	3

## Existing Curriculum

## Proposed Curriculum (Highlight Changes)

Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
				EES OR EES OR EES OR EES	491 494 496 498	Independent Study (1) Internship (1) Field Experience (1) Undergraduate Research (1)	1
GEOG	372-372L	Introduction to GIS & Lab	3	GEOG	372-372L	Introduction to GIS & Lab	3
NRM	110	Introduction to Natural Resource Management	3	NRM	110	Introduction to Natural Resource Management	3
NRM	119	Orientation to Natural Resource Management	2	NRM	119	Orientation to Natural Resource Management	2
NRM	230	Natural Resource Field Techniques	2	NRM	230	Natural Resource Field Techniques	2
NRM	282-282L	Natural Resource Management Statistics & Lab	3	NRM	282-282L	Natural Resource Management Statistics & Lab	3
NRM	300	Laws and Policies in Natural Resource Management	3	NRM	300	Laws and Policies in Natural Resource Management	3
NRM	311	Principles of Ecology	3	NRM	311	Principles of Ecology	3
NRM	311L	Principles of Ecology Lab	1	NRM	311L	Principles of Ecology Lab	1
PHIL OR PHIL	383 454	Bioethics (4) Environmental Ethics (3)	3-4	PHIL OR PHIL	383 454	Bioethics (4) Environmental Ethics (3)	3-4
PHYS OR PHYS	101-101L 111-111L	Survey of Physics & Lab (4) Introduction to Physics & Lab (4)	4	PHYS OR PHYS	101-101L 111-111L	Survey of Physics & Lab (4) Introduction to Physics & Lab (4)	4
PS	213-213L	Soils & Lab	3	PS	213-213L	Soils & Lab	3
PS	243	Principles of Geology	3	PS	243	Principles of Geology	3
RANG	374-374L	Natural Resource Habitat Conservation, Management and Restoration	4	RANG	374-374L	Natural Resource Habitat Conservation, Management and Restoration	4
				EES Major Requirements			12-13
				EES	275	Introduction to Environmental Science	3
				NRM	464	Ecosystem Ecology	3
				PS	243	Principles of Geology	3
				PHIL/ BIOL OR PHIL	383 454	Bioethics (4) Environmental Ethics (3)	3-4
Major Technical Electives			25	Major Technical Electives			25
Select a minimum of 25 credits from the following courses. (*Course requires additional prerequisites or Instructor Consent.)				Select a minimum of 25 credits from the following courses. (*Course requires additional prerequisites or Instructor Consent.)			
BIOL	202-202L	Genetics and Cellular Biology & Lab	4	BIOL	202-202L	Genetics and Cellular Biology & Lab	4
				BIOL	373	Evolution	3
BOT	201-201L	General Botany & Lab	3	BOT	201-201L	General Botany & Lab	3
BOT	301-301L	Plant Systematics & Lab	4	BOT	301-301L	Plant Systematics & Lab	4
BOT	327-327L	Plant Physiology & Lab	4	BOT	327-327L	Plant Physiology & Lab	4
BOT	405-405L	Grasses and Grasslike Plants & Lab	3	BOT	405-405L	Grasses and Grasslike Plants & Lab	3
BOT	415-415L	Aquatic Plants & Lab	3	BOT	415-415L	Aquatic Plants & Lab	3
BOT	419-419L	Plant Ecology & Lab	3	BOT	419-419L	Plant Ecology & Lab	3
CEE	323-323L	Water Supply and Wastewater Engineering & Lab *	3	CEE	323-323L	Water Supply and Wastewater Engineering & Lab *	3
CEE	422-422L	Environmental Engineering Instrumentation & Lab *	3	CEE	422-422L	Environmental Engineering Instrumentation & Lab *	3
CEE	434	Hydrology *	3	CEE	434	Hydrology *	3

## Existing Curriculum

## Proposed Curriculum (Highlight Changes)

Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
CHEM	326-326L	Organic Chemistry I	4	CHEM	326-326L	Organic Chemistry I	4
CHEM	328-328L	Organic Chemistry II *	4	CHEM	328-328L	Organic Chemistry II *	4
CHEM	332-332L	Analytical Chemistry & Lab	3,1	CHEM	332-332L	Analytical Chemistry & Lab	3,1
CHEM	464	Biochemistry I *	3	CHEM	464	Biochemistry I *	3
CHEM	482	Environmental Chemistry *	3-4	CHEM	482	Environmental Chemistry *	3-4
EES	430-430L	Biological Invasions & Lab	3	EES	430-430L	Biological Invasions & Lab	3
EES	491	Independent Study	1-3	EES	491	Independent Study	1-3
EES	494	Internship	1-3	EES	494	Internship	1-3
EES	496	Field Experience		EES	496	Field Experience	
EES	498	Undergraduate Res	1-3	EES	498	Undergraduate Res	1-3
GEOG	473-473L	Data Creation & Integration & Lab	3	GEOG	473-473L	Data Creation & Integration & Lab	3
GEOG	474-474L	Vector Raster Modeling & Lab	3	GEOG	474-474L	Vector Raster Modeling & Lab	3
GEOG	475-475L	GIS Applications & Lab	3	GEOG	475-475L	GIS Applications & Lab	3
GEOG	484-484L	Remote Sensing & Lab	3	GEOG	484-484L	Remote Sensing & Lab	3
HLTH	443	Public Health Science	3	HLTH	443	Public Health Science	3
HLTH	445	Epidemiology	3	HLTH	445	Epidemiology	3
LA	331	Landscape Site Engineering	3	LA	331	Landscape Site Engineering	3
LA	341-341L	Planning Public Grounds & Lab *	3	LA	341-341L	Planning Public Grounds & Lab *	3
LA	352	Planting Design and Specs*	4	LA	352	Planting Design and Specs*	4
MICR	231-231L	General Microbiology & Lab	4	MICR	231-231L	General Microbiology & Lab	4
MICR	310-310L	Environmental Microbiology & Lab*	4	MICR	310-310L	Environmental Microbiology & Lab*	4
MICR	421-421L	Soil Microbiology & Lab	3	MICR	421-421L	Soil Microbiology & Lab	3
NRM	200-200L	Animal Diversity & Lab	3	NRM	200-200L	Animal Diversity & Lab	3
NRM	450-450L	Freshwater Monitoring and Assessment & Lab	3	NRM	450-450L	Freshwater Monitoring and Assessment & Lab	3
NRM	464	Ecosystem Ecology	3	NRM	464	Ecosystem Ecology	3
NRM	466	Environmental Toxicology and Contaminants	3	NRM	466	Environmental Toxicology and Contaminants	3
NRM	482-482L	Natural Resource Management Biometry & Lab	3	NRM	482-482L	Natural Resource Management Biometry & Lab	3
PRAG	353-353L	Physical Climate Meteorology & Lab	3	PRAG	353-353L	Physical Climate Meteorology & Lab	3
PS	362-362L	Environmental Soil Management & Lab	3	PS	362-362L	Environmental Soil Management & Lab	3
PS	412	Environmental Soil Chemistry	3	PS	412	Environmental Soil Chemistry	3
RANG	425-425L	Rangeland Assessment and Monitoring & Lab	3	RANG	425-425L	Rangeland Assessment and Monitoring & Lab	3
				RANG	374-374L	Habitat Conservation and Management & Lab	3
STAT	381	Introduction Probability and Statistics*	3	STAT	381	Introduction Probability and Statistics*	3
STAT	414	Basic R Programming *	1	STAT	414	Basic R Programming *	1
STAT	441	Statistical Methods II *	3	STAT	441	Statistical Methods II *	3
STAT	445	Nonparametric Statistics *	3	STAT	445	Nonparametric Statistics *	3
WL	302	Animal Behavior	3	WL	302	Animal Behavior	3
WL	355-355L	Mammalogy & Lab	3	WL	355-355L	Mammalogy & Lab	3
WL	363-363L	Ornithology & Lab	4	WL	363-363L	Ornithology & Lab	4
WL	367-367L	Ichthyology & Lab	3	WL	367-367L	Ichthyology & Lab	3
WL	417-417L	Large Mammal Ecology & Lab*	3	WL	417-417L	Large Mammal Ecology & Lab*	3
WL	418-418L	Ecology of Aquatic Invertebrates	3	WL	418-418L	Ecology of Aquatic Invertebrates	3
WL	419-419L	Waterfowl Ecology & Management & Lab	3	WL	419-419L	Waterfowl Ecology & Management & Lab	3
WL	427-427L	Limnology & Lab	3	WL	427-427L	Limnology & Lab	3
WL	434-434L	Herpetology & Lab	3	WL	434-434L	Herpetology & Lab	3

*Existing Curriculum*

*Proposed Curriculum (Highlight Changes)*

Pref	Num	Title	Cr Hrs	Pref	Num	Title	Cr Hrs
<b>Electives</b>			<b>5-10</b>	<b>Electives</b>			<b>8-13</b>
<b>Summary of Credits Ecology and Environmental Science (B.S.)</b>							
<b>System General Education Requirements</b>			<b>32-34</b>	<b>System General Education Requirements</b>			<b>32-34</b>
<b>College Requirements</b>			<b>0</b>	<b>College Requirements</b>			<b>0</b>
<b>Major Requirements</b>			<b>78-81</b>	<b>Major Requirements</b>			<b>75-78</b>
Major Core (53-56)				Major Core (38-40)			
Major Technical Electives (25)				EES Major Requirements (12-13)			
Electives			<b>5-10</b>	EES Major Technical Electives (25)			
Electives			<b>5-10</b>	<b>Electives</b>			<b>8-13</b>
Total number of hours required for major			78-81	Total number of hours required for major			<b>74-77</b>
Total number of hours required for degree			120	Total number of hours required for degree			120

**7. Explanation of the Change:**

Changes are proposed for the Ecology and Environmental Science major to include a new specialization in Rangeland Ecology and Management. These changes include removal of NRM 110 Introduction to Natural Resource Management (3 cr.) and RANG 374/L Natural Resource Habitat Conservation, Management and Restoration & Lab (4 cr.) as major core courses, a decrease in major requirement credits, and realignment of EES 275, PS 243 and PHIL 383/PHIL 454 as Major Requirements separate from the major core. The newly proposed specialization in Rangeland Ecology and Management would include the same core courses but a different set of Major Requirements consistent with accreditation requirements.