

# ENVIRONMENTAL SCIENCE



## BUILD A CAREER IN ENVIRONMENTAL SCIENCE

*Learn the skills needed to succeed in the field.*

The Associates program is designed to prepare students for employment or transfer to the Bachelors of Science in Environmental Science or other institutions of higher learning in such areas as wildlife management, environmental quality, and range and grassland management.

The B.S. degree in Environmental Science from Sitting Bull College will provide SBC graduates with a degree that will allow them to compete for jobs and receive career advancement, while obtaining their B.S. degree in environmental science locally. Graduates from SBC's environmental science program will provide essential support for managing local natural resources. Standing Rock Sioux Tribal agencies have expressed an interest in hiring SBC's graduates and those applicants who have showed a dedication to management and an appreciation of field work experience.

The Master's degree in Environmental Science lets students take this learning even further and gain skills and expertise to propel careers and research forward.

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**THIS PROGRAM:**

▸ **PROGRAMS OF STUDY**

▸ **DEGREES**

▸ **DEGREE PLANS**

▸ **COURSE  
DESCRIPTIONS**



# ENVIRONMENTAL SCIENCE MASTER'S PROGRAM

*The Master of Science in Environmental Science program at Sitting Bull College prepares graduates as leaders in environmental, wildlife, and natural resource management fields. Students attain education through research, practical application, and the use of modern technology in order to build intellectual capital. The educational process is guided by western science methodologies balanced with traditional Lakota/Dakota cultural values.*

The graduate program in Environmental Science (ENS) is an extension and builds off of the college's current A.S. and B.S. programs. The program description for the B.S. program states that it is designed to provide students with a background sufficient to make them competitive in the workplace for careers in environmental science, natural resource management, wildlife management, and other science-related disciplines. The program will prepare students to conduct scientific research using methodology necessary to attain results that will be used for science-related, managerial decisions. The graduate program will build upon the objectives of the B.S. program by allowing students to gain greater skills in specific areas.

On the Sitting Bull College website, use the following links to access:

[Admission Requirement Check Sheet](#)

[Admissions Requirements for the Master ENS at SBC](#)

[Graduate Admissions Application](#)

[Graduate Admission Requirements and Costs](#)



**"This program  
provides students  
advanced  
research  
experiences and  
opportunities to  
excel in related  
careers."**



# ***DIVISION OF MATH AND SCIENCE***

***Associate of Science – Environmental Science  
Bachelor of Science – Environmental Science  
Master's of Science – Environmental Science***

## ***PROGRAM OUTCOMES***

### **Program Outcomes For: Associate of Science in Environmental Science**

The student will describe and show competency in the following issues associated with environmental science:

1. The proper use of environmental sampling equipment and current technology in the classroom and in the field according to accepted "Standard Methods";
2. The ability to conduct field sampling and monitoring of air, water, soil, and biomass using appropriate sampling equipment according to accepted "Standard Methods";
3. The ability to conduct an environmental site assessment;
4. The ability to describe, orally and in writing, the similarities and differences between traditional and modern views of the
5. Earth;
6. The ability to demonstrate an understanding of methodology in science research;
7. The ability to describe biological, chemical, and physical influences on environmental media;
8. The ability to describe transport mechanisms for contaminants as they travel through various environmental media; and
9. The demonstration of general knowledge of environmental issues and develops an understanding of environmental impacts resulting from human activities

### **Program Outcomes For: Bachelor of Science in Environmental Science**

The student will describe and show competency in the following issues associated with environmental science:

1. The proper use of environmental sampling equipment and current technology in the classroom and in the field according to accepted "Standard Methods";
2. The ability to design and conduct a field or laboratory study using appropriate sampling equipment and techniques according to accepted "Standard Methods";

3. The ability to describe the similarities and differences between traditional and modern views of the Earth;
4. The ability to describe biological, chemical, and physical influences on environmental media, including human health effects;
5. The ability to describe transport mechanisms for contaminants as they travel through various environmental media;
6. The ability to develop a professional research proposal and demonstrate the various steps of the scientific method in the design;
7. The ability to develop and present a professional research presentation and answer questions in an appropriate manner;
8. The ability to produce a final report of a research project that effectively provides a general narrative of the student's research;
9. The skill to integrate GPS/GIS technology into presentations; and
10. The competency of developing a wildlife conservation and management plan applicable to the needs of the Standing Rock Sioux Reservation and/or the Cheyenne River Sioux Reservation.

**Program Outcomes For: Master's Of Science In Environmental Science**

The student will show competency and mastery in the following skill sets associated with environmental sciences:

1. The student will develop scientific critical thinking skills.
2. The student will demonstrate the ability to articulate knowledge of environmental science, methodologies, and policy both in writing and orally.
3. The student will synthesize a cogent research thesis inclusive of appropriate statistical analysis.
4. The student will demonstrate an understanding of Native Science as it relates to the Lakota/Dakota culture, while maintaining the balance with and the integrity of Western Science.

## **ASSOCIATE OF SCIENCE – ENVIRONMENTAL SCIENCE**

This program is designed to prepare students for employment or transfer to the Bachelors of Science in Environmental Science or other institutions of higher learning in such areas as wildlife management, environmental quality, and range and grassland management.

### **GENERAL EDUCATION REQUIREMENTS**

ENGL 110	Composition I .....	3 cr.
ENGL 120	Composition II .....	3 cr.
COMM 110	Fundamentals of Public Speaking .....	3 cr.
MATH 102	Intermediate Algebra or higher .....	4 cr.
PSYC 100	First Year Learning Experience .....	3 cr.
SOC 120	Transitions-Graduation & Beyond.....	2 cr.
NAS 101 or	Ochethi Sakowin Language I.....	3 cr.
NAS 103	Introduction to Ochethi Sakowin Language, Culture & History	
CSCI 101	Introduction to Computers.....	3 cr.
BIOL 150	General Biology I.....	4 cr.
HUMANITIES or	SOCIAL & BEHAVIORAL SCIENCE .....	3 cr.
	Select any one (1) course from: Arts, English, History, Humanities, Music, Native American	
	Studies, Philosophy, Anthropology, Criminal Justice, Economics, Geography, Human	
	Services, Political Science, Psychology, and Sociology	
HEALTH/PHYSICAL EDUCATION.....		2 cr.
	Any two (2) one-hour courses or any one (1) two-hour course	
<b>Total General Education Requirements.....</b>		<b>33 credits</b>

### **CORE REQUIREMENTS**

BIOL 224	General Ecology.....	4 cr.
CHEM 115/121	Introduction to Chemistry or General Chemistry I.....	4 cr.
ENS 113	Introduction to Environmental Science .....	4 cr.
ENS 202	Environmental Issues.....	2 cr.
ENS 225	Environmental Sampling .....	4 cr.
ENS 240	Environmental Statistics.....	3 cr.
ENS 260	Environmental Research Project I .....	2 cr.
ENS 261	Environmental Research Project II .....	2 cr.
ENS 297	Environmental Science Internship .....	3 cr.
ENS 299	Special Topics.....	1 cr.
STEM Electives 100+ Level.....		3-4 cr.
<b>TOTAL DEGREE REQUIREMENTS.....</b>		<b>65-66 CREDITS</b>



## **BACHELOR OF SCIENCE – ENVIRONMENTAL SCIENCE**

The agencies and organizations where students with degrees in environmental science are obtaining jobs vary greatly. To date, SBC has placed students locally at the Standing Rock Sioux Tribe Environmental Protection Agency, the Cheyenne River Tribe Game and Fish Department, Sitting Bull College, the Standing Rock Sioux Tribe Department of Environmental Regulation, the U.S. Game and Fish Department, MRI Water, and with private farms and ranches.

In addition, to the ample areas of employment available to SBC's environmental science graduates, there are many opportunities available to students pursuing work experiences through internships. SBC environmental science students have conducted work experience internships with the following agencies and organizations: the Natural Resource and Conservation Service, Sioux County Extension, National Aeronautical and Space Administration (NASA), the University of Minnesota, Iowa State University, the United States Forest Service, Sitting Bull College, the Standing Rock Sioux Tribe Environmental Protection Agency, the Standing Rock Sioux Tribe Game and Fish Department, Oahe Veterinary Hospital, and the Experimental Program to Stimulate Cooperative Research (EPSCoR). Many of these entities have expressed a genuine need exists in finding qualified personnel that have a Bachelor of Science degree in environmental science or a natural resources-related field. Advancement in careers is also contingent on obtaining a degree at the B.S. level or higher for nearly all federal and state agencies, as well as with many tribal organizations. The B.S. degree in environmental science from Sitting Bull College will provide SBC graduates with a degree that will allow them to compete for jobs and receive career advancement, while obtaining their B.S. degree in environmental science locally.

Graduates from SBC's environmental science program will provide essential support for managing local natural resources. Standing Rock Sioux Tribal agencies have expressed an interest in hiring SBC's graduates and those applicants who have showed a dedication to management and an appreciation of field work experience.

### **REQUIREMENTS:**

Successful completion of an Associate of Science degree in Environmental Science is required for admission. Requirements for graduation are as follows:

1. Completion of all course work in the curriculum.
2. A minimum of a 2.0 cumulative grade point average.
3. A minimum of 40 credit hours of 300 and 400 level course work.
4. Completion of research project.

### **Environmental Science Course-Transfer Policy**

The following policy will guide the transferability of 100- and 200-level courses from other institutions which are similar to specific required courses within the Professional Core Requirements of the B.S. Environmental Science degree plan. **Although certain courses may be substituted with proper documentation, students will need to take additional 300+ electives in order to fulfill the 46-credit (300+) core requirements.**

- 100-200 level courses may be accepted in place of taking a redundant upper-division course with a similar title, if the course contains more than 75% of similar material from an accredited program and the student completed the course with a "C" (2.0) or better.
- The transfer of a 100-200 level *Introduction to GIS/GPS* course will include the above requirements and the additional requirement of passing the *Sitting Bull College GIS Basic Skills Examination* by answering more than 80% of the questions correctly.

## **BACHELOR OF SCIENCE – ENVIRONMENTAL SCIENCE**

### **GENERAL EDUCATION REQUIREMENTS**

ENGL 110	Composition I .....	3 cr.
ENGL 120	Composition II .....	3 cr.
COMM 110	Fundamentals of Public Speaking .....	3 cr.
MATH 103	College Algebra.....	4 cr.
PSYC 100	First Year Learning Experience .....	3 cr.
SOC 120	Transitions-Graduation & Beyond.....	2 cr.
NAS 101 or	Ochethi Sakowin Language I .....	3 cr.
NAS 103	Introduction to Ochethi Sakowin Language, Culture & History	
NATIVE AMERICAN STUDIES ELECTIVE .....		3 cr.
Select any one (1) course from Native American Studies		
CSCI 101	Introduction to Computers.....	3 cr.
HUMANITIES or SOCIAL & BEHAVIORAL SCIENCE .....		3 cr.
Select any one (1) course from: Arts, English, History, Humanities, Music, Native American Studies, Philosophy, Anthropology, Criminal Justice, Economics, Geography, Human Services, Political Science, Psychology, and Sociology		
HEALTH/PHYSICAL EDUCATION.....		2 cr.
Any two (2) one-hour courses or any one (1) two-hour course		
BIOL 150	General Biology I.....	4 cr.
CHEM 115/121	Introduction to Chemistry or General Chemistry I.....	4 cr.
<b>Total General Education Requirements.....</b>		<b>40 credits</b>

### **ENVIRONMENTAL SCIENCE CORE REQUIREMENTS**

BIOL 224	General Ecology.....	4 cr.
ENS 113	Introduction to Environmental Science .....	4 cr.
ENS 202	Environmental Issues.....	2 cr.
ENS 225	Environmental Sampling .....	4 cr.
ENS 240	Environmental Statistics.....	3 cr.
ENS 260	Environmental Research Project I .....	2 cr.
ENS 261	Environmental Research Project II .....	2 cr.
ENS 297	Environmental Science Internship .....	3 cr.
CHEM 116	Introduction to Organic and Biochemistry .....	4 cr.
SOIL 210	Introduction to Soil Science .....	4 cr.
ARSC 236	Range Management.....	3 cr.
STEM Electives 100+ Level.....		4-5 cr.
<b>Total Environmental Science Core Requirements .....</b>		<b>39-40 credits</b>

### **PROFESSIONAL CORE REQUIREMENTS**

CHEM 403	Analytical Chemistry.....	3 cr.
ENS 301	Hydrology .....	3 cr.
ENS 311	Introduction to GIS/GPS .....	3 cr.
ENS 321	Environmental Chemistry.....	3 cr.
ENS 331	Wildlife Conservation .....	4 cr.
ENS 422	Environmental Toxicology .....	3 cr.
ENS 432	Aquatic Ecosystems.....	3 cr.
ENS 452	Science Literature .....	3 cr.
ENS 453	Environmental Law and Policy.....	3 cr.
ENS 493	Senior Research .....	3 cr.
MATH 314	Applied Statistics.....	3 cr.
SOIL 431	Soil Conservation and Management.....	3 cr.
Electives	300+ Level.....	9 cr.
<b>Total Professional Core Requirements.....</b>		<b>46 credits</b>
<b>TOTAL DEGREE REQUIREMENTS .....</b>		<b>125-126 CREDITS</b>

## ***MASTER'S OF SCIENCE – ENVIRONMENTAL SCIENCE***

The graduate program in Environmental Science (ENS) is an extension and builds off of the college's current A.S. and B.S. programs. The program description for the B.S. program states that it:

... is designed to provide students with a background sufficient to make them competitive in the workplace for careers in environmental science, natural resource management, wildlife management, and other science-related disciplines. The program will prepare students to conduct scientific research using methodology necessary to attain results that will be used for science-related, managerial decisions.

The graduate program will build upon the objectives of the B.S. program by allowing students to gain greater skills in specific areas.

### **Admissions Requirements**

Potential students must submit an application package by the application deadline April 30<sup>th</sup>. Interested individuals will be encouraged to visit SBC and the ENS (Environmental Science) faculty before applying to the graduate program.

### **Requirements of Application Package:**

1. Complete an application for enrollment at SBC
2. Official transcripts from all previous colleges and universities
3. GRE scores
4. Three (3) Letters of Recommendation
5. Curriculum Vitae
6. Letter of Intent – In this letter, the applicant should discuss research interests, academic goals, career goals, and reasons for wanting to attend graduate school. The applicant should discuss how previous work, academic, and personal experiences have prepared them for graduate education and have shaped their research interests.

Applications that are missing any of the above requirements will not be reviewed. All information can be sent to the Office of the Registrar, 9299 Highway 24, Fort Yates, ND 58538.

### **Criteria for Admissions:**

1. Completion of a Bachelor's degree in Environmental Science or related field by the spring semester in which applying.
2. Cumulative GPA of 3.0 or higher
3. Combined GRE scores of 300 or higher
4. Demonstration of readiness for graduate school and scientific research – should be revealed in Letter of Recommendations, CV, and Letter of Intent
5. Students with poor GPAs or GRE scores should still apply. Applicants should use the Letter of Intent and CV to highlight academic and career accomplishments. Students with a good record of research and work experience may still be accepted even though the cumulative GPA or GRE scores are lower than the admission standards.

### **Pre-Admission:**

Applicants that meet the admissions criteria will be asked to interview with ENS faculty before final acceptance into the ENS graduate program is approved. In interviews with ENS faculty, both the applicant and the faculty will determine if the ENS graduate program is a good fit for the applicant. During the interviews, the applicant can ask questions about the program and research projects. Faculty can further determine if the student is truly prepared for graduate school at SBC.



### Special Notes

SBC will be offering the Master's in ENS using a cohort model. Therefore, admission will be on a competitive basis. The first cohort will focus on water quality for field research, so it is highly suggested that applicants have an interest in working in this area.

The program will be offering courses during the day and evening and the program will require an extensive amount of research/field time. It is anticipated that the program will take between two to three years to complete. Therefore, it is highly encouraged that selected participants not hold full-time employment during this period. If the participant does have full-time employment it is highly encouraged that a commitment is received from their employer understanding that the participant will be required to take course(s) and do research/field time during working hours. Half time assistantships may be available for participants in the program, depending on grant funds.

### CORE REQUIREMENTS

ENS 500	Graduate Research Seminar .....	2 cr.
ENS 511	Advanced Experimental Design .....	3 cr.
ENS 515	Advanced Statistics .....	3 cr.
ENS 520	Advanced Techniques in GIS .....	3 cr.
ENS 542	Environmental Policy & Resource Management .....	3 cr.
ENS 545	Applying Dakota/Ochethi Sakowin Culture to Environmental Science .....	3 cr.
ENS 550	Conservation Biology .....	3 cr.
ENS 600	Research and Thesis .....	6-9 cr.
<b>Total Core Requirements .....</b>		<b>26-29 credits</b>

### SPECIALIZATION/EMPHASIS COURSES (MUST TAKE A MINIMUM OF 12 CREDITS)

ENS 522	Advanced Remote Sensing and Digital Image Processing .....	3 cr.
ENS 530	Limnology .....	3 cr.
ENS 532	Watershed Analysis .....	3 cr.
ENS 552	Avian Ecology .....	3 cr.
ENS 554	Grassland Ecology .....	3 cr.
ENS 556	Ecology of Invasive Species .....	3 cr.
ENS 558	Restoration Ecology .....	3 cr.
ENS 560	Advanced Water and Soil Biogeochemistry .....	3 cr.
ENS 562	Microbial Ecology .....	3 cr.
ENS 570	Climate Change .....	3 cr.
ENS 572	Environmental Water Quality .....	3 cr.
ENS 580	Advanced Water Sampling Techniques .....	3 cr.
ATSC 520	Atmospheric Chemistry .....	3 cr.
ATSC 528	Atmospheric Data Analysis .....	3 cr.
ATSC 535	Measurement Systems .....	3 cr.
ATSC 565	Air Quality .....	3 cr.
<b>Total Specialization/Emphasis Requirements .....</b>		<b>12+ credits</b>
<b>TOTAL DEGREE REQUIREMENTS .....</b>		<b>38+ CREDITS</b>