Fort Berthold Community College

Environmental Science Baccalaureate Program
Conceptual Framework

Fort Berthold Community College will provide quality Academic, Cultural, and Vocational Education and Services for the Mandan, Hidatsa, and Arikara Nation.
# Environmental Science Conceptual Framework

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I. INTRODUCTION

Fort Berthold Community College has been an institution of higher education serving the Mandan, Hidatsa, and Arikara people since 1973. The college is currently accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools as a 2-year public institution granting associate level degrees.

As the needs of the Mandan, Hidatsa, and Arikara tribal members on Fort Berthold change, so do the offerings of the college. FBCC listens to its community and builds programs that will have an impact on the reservation. The college is currently in the process of building three baccalaureate programs, a first for the institution. The three programs are Elementary Education with an endorsement in Middle School Mathematics or Science, Native American Studies, and Environmental Science.

FBCC presently offers Associate of Science degrees both in Science and Environmental Science. The following chart shows the number of graduates in both programs over the past ten years.

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Building the Environmental Science Baccalaureate degree officially began when FBCC wrote a grant to the National Science Foundation to assist in the financial aspects of putting together a curriculum, recruiting students, and ultimately getting the program off the ground. The grant was funded in August, 2009 for three secure years, with two years of funding to follow, pending available money.

The first year of the grant was used for a planning year. Initially, there was discussion of whether the Environmental Science program should have a mission and vision, separate from, but included in the college’s mission and vision. The department faculty chose not to because the mission statement of the college is so encompassing and exactly in line with what the program is accomplishing: educating residents of Fort Berthold for the greater good of the reservation. The mission and vision of the college are:

Mission: Fort Berthold Community College will provide quality Academic, Cultural, and Vocational Education and Services for the Mandan, Hidatsa, and Arikara Nation.

Vision: Mandan, Hidatsa, and Arikara Nation Fort Berthold Community College: A dynamic presence that preserves our past and prepares us for the future.
The curriculum was designed with an overhaul to the current Associate’s degree in order to make the program an ideal 2+2 series. Program outcomes were outlined with the question in mind, “what kinds of skills and knowledge does FBCC want the students to learn and take to help Fort Berthold environmentally, ecologically, and scientifically?” An assessment plan was devised as a way for program faculty to ensure that the program is teaching what it aims to and what is put out in the program outcomes.

The program outcomes help to guide the program in the direction where the department feels it should be going. The outcomes established by the department are divided into two year and four year, although upper division coursework will enhance the foundation and erudition of the two year outcomes. The outcomes are not specific in content, but rather require that students are able to pull together information learned in different areas of the curriculum. It is important for graduates to be able to find information on their own, and have the ability to use what they learned in college to extrapolate to a narrow focus in their employment or future education that may be different from what they learned in a specific course.

2 year program outcomes:

- The student will be able to apply the general knowledge and skills which are fundamental to a variety of academic disciplines.
- The student will be able to demonstrate the proper use of environmental sampling equipment in the classroom and in the field according to accepted “Standard Methods.”
- The student will be able to conduct field sampling and monitoring of air, water, soil and biomass using appropriate sampling equipment according to accepted “Standard Methods.”
- The student will be able to describe, orally and in writing, the similarities and differences between traditional native versus modern views of the Earth.
- The student will be able to describe biological, chemical and physical influences on the environment from human activities.
- The student will be able to demonstrate an understanding of the methodology in scientific research through completion of a research paper by selecting, integrating and synthesizing information.
- The student will be able to demonstrate effective literature review methodology by analyzing and evaluating the credibility and completeness of information sources.
- The student will demonstrate general knowledge of current environmental issues on local, regional and global scales.
- The student will able to describe the interactions between and the interdependence of the Earth’s ecosystems.

Additional 4 year program outcomes:

- The student will be able to demonstrate an understanding of advanced scientific research including project design, experimentation, statistical analysis and interpretation, writing and publication, and ethical considerations.
- The student will describe transport mechanisms for contaminants as they travel through various environmental media including water, soil, and air.
- The student will demonstrate an understanding of current environmental issues on Fort Berthold as well as be able to associate them with Mandan, Hidatsa, and Arikara beliefs and cultures.
- The student will be able to explain wildlife population ecology and management options for game and non-game/range species.
- The student will understand the cultural environmental impact of the Mandan, Hidatsa, and Arikara Nation community.
- The student will explain the process involved in, the contents of, the analysis of, and the significance of environmental impact statements and assessments.
- The student will demonstrate the use of environmental geospatial tools.

Thus far, the Environmental Science program has began with a pre-cohort of students who have a goal of earning their B.S. in Environmental Science from FBCC upon accreditation. The students work together in a learning community that will grow stronger each semester that they take classes together. Learning Communities have worked at FBCC in the past because they build a family away from home for the students. The cohort can support and rely on each other and provides a difference of ideas and backgrounds that exposes students to a wider range of learning opportunities. The original pre-cohort will continue on after accreditation to become a cohort and will continue to hold twice monthly seminars on different cultural, regional, or world Environmental Science issues.

The future of Fort Berthold lies in the hands of today’s students. Offering a Bachelor of Science degree in Environmental Science will directly impact the Three Affiliated Tribes by educating the students on local and cultural issues underneath the broader field of current global concerns. Fort Berthold Community College will generate educated tribal members who will protect their resources and people, manage their land and wildlife, and maintain their quality air and water supplies.
II. Faculty

Of the four core faculty that serve the Science Department one holds a Doctorate in Biological Science, one holds a Doctorate in Civil Engineering (focus on Environmental Engineering), one holds a Doctorate in Chiropractic Medicine, and one holds a Baccalaureate Degree in Chemistry with over 20 years working as an industrial chemist. The faculty members are all involved with multiple grants and training programs that keep them involved in research and current and local issues in environmental science. The faculty members impart this knowledge to students through classroom courses, mentorship in research projects, and supervising internships. Because of the small size of the department, both in students and faculty, the faculty members work closely with the students.

Technology

Faculty members are encouraged and trained to utilize technology within their courses to increase the ability and experience of their students prior to graduation. One of the courses required in the baccalaureate degree plan is the Fundamentals of GPS/GIS/RS. They are also required to write research papers and present them during their senior year. Black Board is used with the students as a means of communicating on courses on the institutional level as well as incorporating technology content as part of the syllabus in coursework. They are expected to present power point presentations; do field research and literature searches for courses, and as a final exit from the college to have developed an e-portfolio. This e-portfolio will highlight all the best practice documents as well as audio/visual collections of their work and research while at FBCC.

Diversity

One of the tenants of the Fort Berthold Community College/Earth Lodge Values Model is that of culture, specifically that of the Three Affiliated Tribes, the Mandan, Hidatsa and Arikara. Not only are faculty expected to inculcate culture into their curriculum and syllabus; but also to explore the diverse backgrounds of its entire people that reside within the boundaries of our region. The majority of faculty has a varied degree of cultural background and experiences prior to coming to FBCC and is also encouraged to participate in exchanges through professional experiences with other higher levels of institution. The inclusion of local culture in the Environmental Science program is essential because of the current concerns regarding the oil development on Fort Berthold and because the Mandan, Hidatsa, and Arikara people have always viewed their land as essential to living.

Faculty Evaluation

Science faculty members are evaluated regularly at Fort Berthold Community College. As with every faculty member at FBCC, there are course evaluations at the end of every course that are filled out by students. Unfortunately, the course evaluations are not specific to each department, but ask students about what they learned, how much they learned and if culture, technology and constructivism were integrated into the course. These are collected by the FBCC Data Manager, compiled, kept for documentation and copies of the anonymous results are given to each instructor for each course. This process is carried out at the end of each
semester. The downfall of such course evaluations is that it does not solicit reviews from students who have dropped the course or who may not be present on the day they are given.

Each faculty member at FBCC also undergoes another evaluation process every semester called a Small Group Instructional Diagnosis (SGID). Each instructor arranges for one class at mid-semester to be evaluated. Another faculty member comes into the classroom and listens to and discusses the positive and negative aspects of the class so far into the semester. This method of assessment brings about very helpful and constructive criticism of the class. The evaluating faculty member then anonymously types the comments and discusses them with the instructor of the course. This is an effective way for faculty to assess what is going on in their classroom and make positive changes during the current semester. A copy of the SGID evaluation is kept by the instructor and in his/her file in the office of the Vice President of Academic Affairs.

At the end of the academic year, each faculty member meets with two colleagues and either the Vice President of Academic Affairs or the Faculty Chair. An overall evaluation is filled out based on the SGIDs from fall to spring, the course evaluations from fall and spring, an Individual Development Plan, and an electronic portfolio created and updated by the faculty member. The Individual Development Plan is a tool for faculty to track their professional development, strengths, weaknesses and short and long term goals. The professional development will indicate, by year’s end, if they grew at a professional level. The strengths and weaknesses should point the instructor in a direction the following year towards possible professional and personal development.

As dictated in the Faculty Handbook, instructors at FBCC have academic freedom in their classrooms. How instructors decide to interpret and utilize the comments from the SGIDs and course evaluations is ultimately up to them. It should be evident through the evaluation process at the end of the academic year if improvements in teaching, scholarship and service are necessary.

At this time, course evaluations are given for full-time faculty and adjunct faculty, however the SGID is optional for adjunct faculty. Adjunct faculty members also do not have the overall evaluation with the team of two colleagues and Vice President of Academic Affairs.

**Professional Development**

FBCC offers several professional development activities to all faculty members every year. These almost always relate to culture in the classroom, technology, research, or constructivism, a method of teaching which is expected in every classroom. These are the areas that the Vice President for Academic Affairs feels are most important for the faculty. In the future, it is likely that the faculty will continue to get training in similar areas.

Every year the Vice President for Academic Affairs schedules a week-long training in various professional development topics in May after the spring semester finishes and before the summer semester begins. This is mainly for full-time faculty; but adjunct faculty members are invited as well. Throughout the academic year, there is almost always a technology training that may be several sessions stretched out over several months. Examples of past trainings in technology include Blackboard, building on-line courses, advising with Jenzabar (system) and Microsoft Office components. In addition, there are also cultural trainings for both faculty and staff of the college every year. Faculty members are also encouraged to attend trainings in
their discipline, as well as conferences offered by the QEM (Quality Education for Minorities) Network.

In addition, Science faculty members are involved in multiple grants and collaborations for which there are professional development trainings. As time allows, faculty members can select trainings that they feel are related to their area of interest. One faculty member has focused on all aspects of the reintroduction of juneberries, while another has traveled with students to carry out research with NASA.
III. Facilities/Equipment

Fort Berthold Community College is furnished with the necessary space and equipment to carry out a baccalaureate degree in Environmental Science. The laboratory has four lab benches, a ventilation hood, and the subsequent equipment and glassware. In addition, this laboratory is also equipped with an Interactive Video Network (IVN) that is linked to other colleges and universities in North Dakota. The advantage of having this network in the lab is that FBCC has the ability to collaborate with professionals throughout the state to teach a course.

Next door is the science classroom, which is currently being set up with a SmartBoard and projector. The classroom has ample seating for FBCC’s small class size and also stores the Science and Environmental Science Departments’ library collection.

The new computerized science and GIS lab is located on the second floor of the Science and Technology Wing. It contains 15 computers and 2 GIS workstations with a plotter. The computers are utilized by numerous Science and Environmental Science classes and laboratory simulations and web-based activities. This brand new lab is currently being integrated into existing coursework and laboratory activities. Computer Assisted Software is continually added to offer students more simulated laboratory options.

The new GPS/GIS workstations have already been used on GIS classes and to assist in research projects and plans to expand its use into more coursework and research activities are underway for the future. The room is also equipped with projector capabilities for electronic presentations and student assistance.

FBCC has a Land Lab that is located three miles west of campus on Army Corps of Engineers land and is 7.2 acres in size. The Land Lab has two Juenberry research plots and provides a site for students to conduct research. There are also seven plots (4.2 acres) that are irrigated and a Traditional Garden is planted in a Mandan, Hidatsa, Arikara configuration utilizing traditional seeds provided by the Tribes.

Other facilities

FBCC students have a recreation room with television, couches and a pool table for student use. There is also an internet lounge with a television, couches, study tables, wireless internet and computers for all students to check-out for use. The FBCC library has areas of study, as well as ample computers and printers available for student use. The Doka Hog Mahoo grant supports library acquisitions to provide materials for the baccalaureate curriculum.

FBCC is equipped with a wireless connection throughout the college. There are four computer labs/ classrooms that are mostly available for student use when classes are not in session. Most classrooms have overhead projection capable of linking to the internet and network. Some students may also have classes over the CLAN system. This is a system that enables students from FBCC’s distant sites, Mandaree and White Shield to take classes in real time via a television network. The core Environmental Science courses are not offered in this manner, but the students may take some of their general education courses over this system.
Library Resources

The Fort Berthold Library and Learning Resource Center (LLRC) provide students access to over 12,000 volumes in its collection. An additional 5,000 volumes are available through subscriptions to NetLibrary eBooks virtual library collection. The LLRC participates in the North Dakota interlibrary Loan system and can borrow almost any title available for lending in the North Dakota University System (NDUS) on-line library catalog ODIN system. Through subscriptions to OCLC databases LLRC can extend this access to borrow books or other materials to all libraries in the OCLC national library system. Through subscriptions to 55 on-line databases, students have access to full text articles from professional journals, primary source documents, newspapers, creative works and multi-media. These databases provide historical coverage and are also updated to the current month.

FBCC offers all of its students the same accessibility to its resources. Environmental Science students are currently required to take core program courses on the main campus, so ease of access by off-campus, distance learning, and alternate route programs is not critical to the program. However, students can check out a lap top computer from the college for use at home and access to the library’s databases are all available off campus by logging in with a provided password.

Technology Resources

FBCC mandates that instructors incorporate technology into every class that is offered. The main classroom management system that the college utilizes is Blackboard. From this internal center, the students can go on-line and have access to their course documents, grades and assignments. Research is an integral element of many courses at FBCC and information technology training is offered to students in required Psychology of Student Success course, student orientation and by request of faculty in their classes. The library has 55 on-line databases to support faculty and candidate research. There are four computer lab classrooms on campus, as well as computers for student use located throughout the college. Access to the library webpage and its on-line databases is available from any of these computers, via campus-wide connection or from home using a password that is available to FBCC student and staff. In a push toward technology literacy, faculty members are encouraged to include information technology and literacy in each of their courses. Therefore, almost all faculty members required use of the information technology resources that the library has available to students. For example, students must retrieve journal articles written on their topic of interest from the on-line databases.
IV. CURRICULUM

The Environmental Science Curriculum was established by three full-time Science faculty members by means of discussing what was important to Fort Berthold for an Environmental Science program, studying other four year institutions’ precedents, and conferring with a consultant faculty member of Sitting Bull College in Fort Yates, North Dakota.

In setting up the curriculum, it was important to the FBCC faculty members to provide a seamless transition from the A.S. degree in Environmental Science into the B.S. degree. By doing so would provide an incentive for students to apply for their A.S. degree halfway through the program, and also would entice students who initially sought only a two year degree to move on into the four year program, whether it is full-time or gradually one course at a time.

Consequently, the A.S. degree plan was tweaked to allow for an ideal transition between the two programs. Because of this, the two year plan contains an elective allowance for the student to be able to choose between three different areas: chemistry, GPS/GIS/RS, and Range Management. All of these courses must be taken for the Baccalaureate degree. Also, an Environmental Science internship was added to the A.S. degree plan to be taken at the end of the sophomore year.

The courses chosen for the curriculum provide a foundation in a range of specialties including: water, air, and soil quality; wildlife, range, and fisheries management; toxicology; and resource conservation. Because it is the mission of the college to provide academics for members of the Three Affiliated Tribes, it is necessary to offer a program with a wide range of Environmental Science areas. Too narrow of a scope would over-saturate the knowledge base on the reservation. The current curriculum allows for three to four courses of electives at the 300 and 400 course levels. With this allowance, the sophomore internship, and the open Senior Research requirement, students will diversify their interests from each other, creating a varied interest and knowledge based workforce for Fort Berthold.

The following pages show the degree plans for the Associate of Science degree and the Bachelor of Science degree in Environmental Science and the course schedule including the faculty who will teach the courses and when they will be taught.
**FORT BERTHOLD COMMUNITY COLLEGE**

Major: A.S. Environmental Science  
Credit Hours Required (66/67 cr)

Name:_________________________________  Date__________________________________  Advisor:________________________________

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ENVIRONMENTAL SCIENCE COURSE DESCRIPTIONS

BIO 124 – Environmental Science
A study of the evolving relationships of humans and the environment, which will use an interdisciplinary approach to understanding the major global and local environmental problems. Case studies will emphasize the scientific method as well as the legal, ethical, political, and/or cultural approach for environmental sustainability. Labs will introduce global environmental tools such as geospatial software and local ecological species impacted by development or invasive species.

BIO 150 – Biology I
Basic biological concepts include the fundamental processes of cells and life systems, genetics, and evolution. Includes laboratory.

SOIL 210 – Introduction to Soil Science
Physical, chemical, and biological properties of soils as related to use, conservation, and plant growth.

GEOG 125 – Fundamentals of the Global Positioning System (GPS), Geographical Information System (GIS), and Remote Sensing (RS)
This course is designed to be an introductory overview of the global positioning system (GPS), Geographical Information System (GIS) and remote sensing (RS). A hands-on approach is central to the processes employed. Multi-spectral data manipulation will be introduced.

ARSC 236 – Introduction to Range Management
Principles of range management, which include plant identification, range evaluation, and range improvement.

CHEM 115 – Introductory Chemistry
Introduces students to basic principles and concepts of chemistry. Topics include atomic theory, stoichiometry, bonding and nuclear chemistry. Includes laboratory. Prerequisite: MA 102 or consent of instructor.

CHEM 116 – Introduction to Organic and Biochemistry
Study of carbon Chemistry. Functional, groups, bonding and uses, with special emphasis on applications to living systems. Includes laboratory. Prerequisite: Chem 115 or consent of instructor.

CHEM 121 – Chemistry I
An introduction to the principles of chemistry, including scientific method and problem solving, atomic theory, elements and compounds, stoichiometry, equations, and thermodynamics. Includes laboratory.
CHEM 122 – Chemistry II
A continuation of Chemistry I with an emphasis on bonding and molecular structures, equilibrium, and applied chemistry. Introduces organic and biochemistry. Includes laboratory. Prerequisite: Chemistry I

BIO 225 – Research Methods
Introduction to basic physical and biological field measurements. Students will learn to use appropriate equipment to identify, quantify, and record resources in the field.

BIO 230 – Field Research I
The student will identify a specific problem related to the field of his/her interest within Environmental Science. He/She will conduct a literature review, design a research project, and collect field data related to that problem. Prerequisite: BIO 225.

BIO 232 – Field Research II
A continuation of BIO 230 - Field Research I. The student will continue gathering field data and write a report in scientific style. Oral presentation of report required. Prerequisite: BIO 230.

BIO 240 – Ethnobotany
Introduction to basic physical and biological field measurements. Students will learn to use appropriate equipment to identify, quantify, and record resources in the field.

BIO 297 – Environmental Science Internship
This course provides the student an opportunity to experience environmental science in the workplace in conjunction with their program of study. One semester hour of credit will be earned for each 45 contact hours of internship. The student’s advisor will approve the location. Prerequisite: Must be completed during last two semesters of Environmental Science degree plan.

BIO 316 – Global Climate Change
This course covers an overview of the basic concepts, issues and policies related to climate change, comparing global issues with regional problems, related problems, and solutions.

BIO 324 – Ecology
Overview of the principles governing the interrelationship between plants, animals, and environments. Emphasis is on ecological communities throughout North America. Includes laboratory and field activities. Prerequisite: BIO 150 or consent of instructor.

BIO 331 – Soil Ecology
This course engages students with the principles of soil-plant-animal interactions and their influences on environmental and agricultural issues of global significance (e.g.,
sustainable agriculture, global climate change, diversity conservation). Pre-requisite SOI 210

BIO 350 – Freshwater Biology
Students will learn the biological, chemical, and physical characteristics of inland waters including origins, interrelationships and the effect of civilization. Topics covered will include rivers, lakes, reservoirs, and wetlands. Prerequisites: Biology 150 and Biology 151. Includes laboratory.

BIO 370 – Vertebrate Zoology
Students will be introduced to the natural history, classification, anatomy and physiology of the vertebrates. This course includes methods of observing, identifying, and collecting local vertebrates.

BIO 420 – Air and Water Quality
The course will acquaint students with sources, dispersion patterns, effects, and regulations of air and water pollutants. Sampling and analysis of air and water pollutants included during lab.

BIO 421 – Environmental Chemistry & Toxicology
In this course, students will understand and examine methods of perceiving chemical nature of the environment at the atomic and molecular level. Topics will include the makeup and contamination by anthropomorphic sources of the water, soil and air. Environmental process and involving the fate or distribution of natural or manmade materials will be addressed in the nutrient cycles, radiation, greenhouse gases, acid rain, aerosols chemistry, conversion of polymeric materials which resist degradation. Toxicology will discussed in regards to the effects of those elements or compounds which threaten the diverse ecological systems as well as the poisonous effects on man. Exposure limits, chronic exposure, bioaccumulation, bioremediation, detoxification and sustainable management of agriculture, industrial and energy development will also be addressed.

BIO 422 – Environmental Law
A survey of the laws related to natural resources use and management at local, state, tribal and federal levels.

BIO 431 – Wildlife & Fisheries Conservation & Management
In this course, students will study the management of fish, wildlife, and other populations. Students will apply principles from various subdisciplines of the biological and social sciences to current conservation problems. The course will examine topics such as predation, wildlife and ichthyological diseases, carrying capacity, and the history of wildlife conservation and management. Focus will be on species located on Fort Berthold, both historically and presently, as well as Mandan, Hidatsa, and Arikara
cultural beliefs and practices. Pre-requisite: BIO 150-Biology I, BIO 324-Ecology, or consent of the instructor.

**BIO 452 – Scientific Literature & Writing**
This course is designed to prepare students to objectively read, examine, and interpret scientific research literature. Students will examine all aspects of information literacy as it applies to their field of study. Students will also learn the methodology of writing research papers for publication. Pre-requisites: MATH 210-Statistics, BIO 150-Biology I, BIO 225-Research Methods, BIO 297-Environmental Science Internship.

**BIO 460 – TAT Environmental Issues, Beliefs & Ethics**
Students will understand and examine the methods of perceiving and strategizing environmental issues of concern for Mandan Hidatsa and Arikara Nation. This course will focus cultural beliefs and ethics concerning environmental issues as they relate to the current energy development and its environmental impact. Other general environmental topics related to natural resource development will also be addressed. As the issues are clarified the potential for energy and resource perspectives will allow for strategic planning for long term sustainable scenarios to be summarized. Collaboration and research will be done with student groups and faculty projects to be developed in the class with the collaboration and review of environmental agencies and other university sources. Cultural input will be part of the collaborative efforts of this dynamic, interdisciplinary and problem solving science course.

**BIO 493 – Senior Research**
This course involves students in experimental design, field or lab experimentation, data analysis, and conclusions. Prerequisite: Senior status and approval of advising instructor and Department Chairperson.

**BIO 433 – Wildlife Ecology**
This course will examine the theory of population dynamics and the relationship between species and their resources. Population, community, and ecosystem levels of organization will be studied, as well as adaptations, key animal behavior concepts, and feeding. Focus will be on species located on Fort Berthold, both historically and presently, as well as Mandan, Hidatsa, and Arikara cultural beliefs and practices. Pre-requisite: BIO 150-Biology I, BIO 324-Ecology or by permission of the instructor.

**BIO 443 – Range Ecology**
This course is designed to study the dynamics and structure of range plants and animals upon each other and the environment in which they are living. Human activities and their effects will be examined as well as the principles and practices of conservation and management. The role of herbivores on species composition and distribution of plant communities on Fort Berthold will be considered. Emphasis will include Mandan,
Hidatsa, and Arikara cultural beliefs and practices. Pre-requisite: ARSC 236-Introduction to Range Management

**BIO 444 – Environmental Science & Ecology of the Northern Plains**

Students will understand and examine the methods of perceiving and strategizing environmental issues of concern for Mandan Hidatsa and Arikara Nation. This course will focus cultural beliefs and ethics concerning environmental issues as they relate to the current energy development and its environmental impact. Other general environmental topics related to natural resource development will also be addressed. As the issues are clarified the potential for energy and resource perspectives will allow for strategic planning for long term sustainable scenarios to be summarized. Collaboration and research will be done with student groups and faculty projects to be developed in the class with the collaboration and review of environmental agencies and other university sources. Cultural input will be part of the collaborative efforts of this dynamic, interdisciplinary and problem solving science course.

**BIO 450 – Mammalogy**

This course will look at mammalian taxonomy, anatomy, ecology, behavioral adaptations, identification, distribution, conservation, and mammalian relationships to humanity. There will be an emphasis placed on learning both traditional and modern techniques that are used to study mammals. Common species to Fort Berthold, as well as those sacred to the Three Affiliated Tribes and other indigenous people will be explored. Pre-requisite: BIO 150-Biology I, BIO 370-Vertebrate Zoology or consent of the instructor.
V. INTERNSHIP

The Environmental Science Internship was built into the curriculum as a requirement for the Associate’s Degree, which makes it a requirement for the Baccalaureate Degree as well. By involving students in an internship, it exposes them to employment in the field of environmental science at a local level. BIO 297 – Environmental Science Internship is a 2 credit course and will typically be taken over the summer months, when students are able to put more focus into the experience. At FBCC, each credit of an internship requires 45 hours of work, making BIO 297 necessitating 90 hours at the host agency or organization at which the student is interning. Students may also complete their internships at FBCC in the science department, working on special projects or carrying out research, although it is important to note that the internship course should have a different focus than the research courses taken in the program. Along with research, the students should also be learning and experiencing a workplace atmosphere and expectations.

The course description for BIO 297 – Environmental Science Internship reads:

This course provides the student an opportunity to experience environmental science in the workplace in conjunction with their program of study. One semester hour of credit will be earned for each 45 contact hours of internship. The student’s advisor will approve the location. Prerequisite: Must be completed during last two semesters of Environmental Science degree plan.

The forms from the most recent Intern Packet are located in Appendix A.
VI. Senior Research

During their final semester before graduation, students will take the 3 credit course, BIO 493 - Senior Research. Because of the hands-on nature of the program, most students will have a research project that has been developing since their sophomore year in the program. Students are encouraged to continue with this research during the 3 credit course. By the time students are at the senior level, they should have a well developed and comprehensive project. It is anticipated that the senior research projects will be demonstrated, both in poster form and orally, at the annual AIHEC (American Indian Higher Education Consortium) competition in March.

As part of the class and as a requirement of graduating in the Environmental Science program at FBCC, students must present their research project in the form of a power point presentation two weeks before graduation. The presentation will be before a panel of Environmental Science faculty and FBCC administrators, as well as invited family members.

The rubric to evaluate the senior research presentations is following. It was designed to allow for non-experts to be able to score the seniors, as well as department members.
## Environmental Science Senior Research Presentation Rubric

<table>
<thead>
<tr>
<th></th>
<th>Excellent 4 points</th>
<th>Very Good 3 points</th>
<th>Average 2 points</th>
<th>Below Average 1 point</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oral Presentation</strong></td>
<td>Speaks clearly and distinctly. Speaks with confidence and without unnecessary hesitation. Connects with audience.</td>
<td>Minor problems with oral presentation.</td>
<td>Manages a &quot;fair&quot; job with the oral presentation.</td>
<td>Oral presentation fails to reach an acceptable level.</td>
<td></td>
</tr>
<tr>
<td><strong>Visual Presentation</strong></td>
<td>Visuals enhance the presentation rather than detract. Slide layout is appropriate and clear.</td>
<td>Minor problems with visual presentation.</td>
<td>Manages a &quot;fair&quot; job with the visual presentation.</td>
<td>Visual presentation fails to reach an acceptable level.</td>
<td></td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td>Material is clearly well-organized with an introduction, conclusion, and logical progress.</td>
<td>Minor problems with organization.</td>
<td>Manages a &quot;fair&quot; job with the organization.</td>
<td>Organization fails to reach an acceptable level.</td>
<td></td>
</tr>
<tr>
<td><strong>Grasp of Content</strong></td>
<td>Obvious through presentation and interaction that presenter has a good grasp of the content.</td>
<td>Minor problems with grasp of content.</td>
<td>Displays a fair grasp of content.</td>
<td>Displays less than an acceptable grasp of content.</td>
<td></td>
</tr>
<tr>
<td><strong>Overall Impression</strong></td>
<td>As a whole an interesting and engaging presentation showing evidence of significant research.</td>
<td>Good, but not outstanding.</td>
<td>Fair.</td>
<td>Negative impression.</td>
<td></td>
</tr>
</tbody>
</table>

### Comments on Oral Presentation
- Speaks clearly and distinctly. Speaks with confidence and without unnecessary hesitation. Connects with audience.
- Minor problems with oral presentation.
- Manages a "fair" job with the oral presentation.
- Oral presentation fails to reach an acceptable level.

### Comments on Visual Presentation
- Visuals enhance the presentation rather than detract. Slide layout is appropriate and clear.
- Minor problems with visual presentation.
- Manages a "fair" job with the visual presentation.
- Visual presentation fails to reach an acceptable level.

### Comments on Organization
- Material is clearly well-organized with an introduction, conclusion, and logical progress.
- Minor problems with organization.
- Manages a "fair" job with the organization.
- Organization fails to reach an acceptable level.

### Comments on Grasp of Content
- Obvious through presentation and interaction that presenter has a good grasp of the content.
- Minor problems with grasp of content.
- Displays a fair grasp of content.
- Displays less than an acceptable grasp of content.

### Comments on Overall Impression
- As a whole an interesting and engaging presentation showing evidence of significant research.
- Good, but not outstanding.
- Fair.
- Negative impression.

<table>
<thead>
<tr>
<th>Score</th>
<th>Total</th>
</tr>
</thead>
</table>

Name ____________________________  Date ____________________________
VII. ELECTRONIC PORTFOLIO

Students in the baccalaureate program for Environmental Science at Fort Berthold Community College are required to take both Front Page I and Front Page II. In these courses, students learn how to build an effective electronic portfolio to showcase their accomplishments during their education.

Students in many programs are required to complete an electronic portfolio, but because the general FBCC student template is designed for associate degrees, the Environmental Science template is specified for the program. It includes areas for students’ research, course artifacts, and beliefs about environmental issues on Fort Berthold. In addition, students must enter either artifacts or journaling proving an understanding of the Environmental Science program outcomes. The program outcomes are:

2 year program outcomes:
- The student will be able to apply the general knowledge and skills which are fundamental to a variety of academic disciplines.
- The student will be able to demonstrate the proper use of environmental sampling equipment in the classroom and in the field according to accepted “Standard Methods.”
- The student will be able to conduct field sampling and monitoring of air, water, soil and biomass using appropriate sampling equipment according to accepted “Standard Methods.”
- The student will be able to describe, orally and in writing, the similarities and differences between traditional native versus modern views of the Earth.
- The student will be able to describe biological, chemical and physical influences on the environment from human activities.
- The student will be able to demonstrate an understanding of the methodology in scientific research through completion of a research paper by selecting, integrating and synthesizing information.
- The student will be able to demonstrate effective literature review methodology by analyzing and evaluating the credibility and completeness of information sources.
- The student will demonstrate general knowledge of current environmental issues on local, regional and global scales.
- The student will be able to describe the interactions between and the interdependence of the Earth’s ecosystems.

Additional 4 year program outcomes:
- The student will be able to demonstrate an understanding of advanced scientific research including project design, experimentation, statistical analysis and interpretation, writing and publication, and ethical considerations.
- The student will describe transport mechanisms for contaminants as they travel through various environmental media including water, soil, and air.
• The student will demonstrate an understanding of current environmental issues on Fort Berthold as well as be able to associate them with Mandan, Hidatsa, and Arikara beliefs and cultures.
• The student will be able to explain wildlife population ecology and management options for game and non-game/range species.
• The student will understand the cultural environmental impact of the Mandan, Hidatsa, and Arikara Nation community.
• The student will explain the process involved in, the contents of, the analysis of, and the significance of environmental impact statements and assessments.
• The student will demonstrate the use of environmental geospatial tools.

The rubric used to evaluate the electronic portfolios is following.
### Environmental Science

#### Electronic Portfolio Assessment Rubric

<table>
<thead>
<tr>
<th>Category</th>
<th>4 points</th>
<th>3 points</th>
<th>2 points</th>
<th>1 point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selection of artifacts and written communication</strong></td>
<td>All artifacts and work samples are clearly and directly related to the purpose of the e-portfolio. It is clear why they were chosen to be part of the portfolio.</td>
<td>Most artifacts and work samples are related to the purpose of the e-portfolio. It is mostly obvious why they were chosen to be part of the portfolio.</td>
<td>Few artifacts and work samples are related to the purpose of the e-portfolio. It is unclear why the artifacts and work samples are in the portfolio.</td>
<td>Most artifacts and work samples are unrelated to the purpose of the e-portfolio.</td>
</tr>
<tr>
<td><strong>Reflections</strong></td>
<td>All reflections clearly provide insight into professional growth, express how each program outcome has applied to his/her learning, and are productive in nature.</td>
<td>Most of the reflections provide insight into professional growth, express how each program outcome has applied to his/her learning, and are productive in nature.</td>
<td>A few of the reflections provide insight into professional growth, express how each program outcome has applied to his/her learning, and are productive in nature.</td>
<td>No reflections provide insight into professional growth, express how each program outcome has applied to his/her learning, and are productive in nature.</td>
</tr>
<tr>
<td><strong>Use of Multimedia</strong></td>
<td>All of the photographs, graphics, sound and/or video are appropriate examples, are easy to understand, and increase the overall significance of the e-portfolio.</td>
<td>Most of the photographs, graphics, sound and/or video are appropriate examples, are easy to understand, and increase the overall significance of the e-portfolio.</td>
<td>There are only a few photographs, graphics, sound and/or video that are appropriate examples, easy to understand, and increase the overall significance of the e-portfolio.</td>
<td>The photographs, graphics, sound and/or video are missing or are inappropriate examples. They do not increase the overall significance of the e-portfolio.</td>
</tr>
<tr>
<td><strong>Captions</strong></td>
<td>Each artifact and work sample has a caption that clearly explains the importance and significance of that particular work. The date is included.</td>
<td>Most of the artifacts and work samples have a caption that clearly explains the importance and significance of that particular work. The date is included most of the time.</td>
<td>A few of the artifacts and work samples have a caption that clearly explains the importance and significance of that particular work. The date is rarely included.</td>
<td>None of the artifacts and work samples have captions.</td>
</tr>
<tr>
<td><strong>Ease of Navigation</strong></td>
<td>All of the e-portfolio navigation and section links work correctly and all external links connect to the appropriate website.</td>
<td>Most of the e-portfolio navigation and section links work correctly and most of the external links connect to the appropriate website.</td>
<td>Some of the e-portfolio navigation and section links work correctly and some of the external links connect to the appropriate website.</td>
<td>None of the e-portfolio navigation and section links work correctly and none of the external links connect to the appropriate website.</td>
</tr>
<tr>
<td><strong>Layout and Text Components</strong></td>
<td>The e-portfolio is easy to read. Text components (size, bullets, italics, bold, color, etc.) enhance the presentation of the</td>
<td>The e-portfolio is generally easy to read. Text components (size, bullets, italics, bold, color, etc.) mostly enhance the</td>
<td>The e-portfolio is often difficult to read. Text components (size, bullets, italics, bold, color, etc.) do not enhance the</td>
<td>The e-portfolio is difficult to read. Text components (size, bullets, italics, bold, color, etc.) detract from the presentation of</td>
</tr>
<tr>
<td>Writing Mechanics</td>
<td>Artifacts/Reflections are included that satisfy the following program outcomes:</td>
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<tr>
<td></td>
<td>Met</td>
<td>Not Met</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information.</td>
<td>There are no errors in grammar, capitalization, punctuation, and spelling.</td>
<td>There are a few errors in grammar, capitalization, punctuation, and spelling.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal and vertical white space is used appropriately and the background colors make readability easy and comfortable.</td>
<td>Presentation of the information and sometimes detract. Horizontal and vertical white space is used inappropriately and the background colors make readability generally difficult.</td>
<td>There are 4 or more errors in grammar, capitalization, punctuation, and spelling.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation of the information and sometimes detract. Horizontal and vertical white space is used inappropriately and the background colors make readability generally difficult.</td>
<td>The text has more than 6 errors in grammar, capitalization, punctuation, and spelling.</td>
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</tbody>
</table>

The student will be able to apply the general knowledge and skills which are fundamental to a variety of academic disciplines.

The student will be able to demonstrate the proper use of environmental sampling equipment in the classroom and in the field according to accepted “Standard Methods.”

The student will be able to conduct field sampling and monitoring of air, water, soil and biomass using appropriate sampling equipment according to accepted “Standard Methods.”

The student will be able to describe, orally and in writing, the similarities and differences between traditional native versus modern views of the Earth.

The student will be able to describe biological, chemical and physical influences on the environment from human activities.

The student will be able to demonstrate an understanding of the methodology in scientific research through completion of a research paper by selecting, integrating and synthesizing information.

The student will be able to demonstrate effective literature review methodology by analyzing and evaluating the credibility and completeness of information sources.

The student will demonstrate general knowledge of current environmental issues on local, regional and global scales.

The student will able to describe the interactions between and the interdependence of the Earth’s ecosystems.

The student will be able to demonstrate an understanding of advanced scientific research including project design, experimentation, statistical analysis and interpretation, writing and publication, and ethical considerations.
The student will describe transport mechanisms for contaminants as they travel through various environmental media including water, soil, and air.

The student will demonstrate an understanding of current environmental issues on Fort Berthold as well as be able to associate them with Mandan, Hidatsa, and Arikara beliefs and cultures.

The student will be able to explain wildlife population ecology and management options for game and non-game/range species.

The student will understand the cultural environmental impact of the Mandan, Hidatsa, and Arikara Nation community.

The student will explain the process involved in, the contents of, the analysis of, and the significance of environmental impact statements and assessments.

The student will demonstrate the use of environmental geospatial tools.

Use this area for reviewer comments.

<table>
<thead>
<tr>
<th>Total Rubric Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>/28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ND State Standards/Core Merits Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>/16</td>
</tr>
</tbody>
</table>
VII. ORAL CAPSTONE

The culmination of the Environmental Science Baccalaureate Degree is the oral capstone. The oral capstone is an oral examination given to graduating students in front of a small panel of faculty, administrators, and family members if they desire. Before each student is able to graduate, he/she must demonstrate knowledge learned in the Environmental Science program. The students will be given a list of possible questions beforehand that encompass and connect concepts, facts, and ideas learned in their classes at FBCC. They will also be asked to discuss and/or present their senior research project and describe the outcomes of any other research performed during their education including AIHEC, SEEDS, or intern projects.

It is important to note that the oral capstone is not scored to assess the individual student, but the program as a whole. It does not figure into a student’s GPA, nor does a failed score mean that he/she cannot graduate. Because of the emphasis put on the capstone and the panel of faculty, administrators, and possible family members, it is expected and presumed that the graduating students will come prepared for the exam and give an honest assessment of how the program is educating its students.

Following is a list of possible questions that have been developed although more questions may be generated or refined as the program continues. Following the questions is the rubric that was designed to allow for assessment of the oral capstone as the student is answering the questions. It was built to allow for non-experts to be able to score as well.
Environmental Science Possible Oral Capstone Questions:

Students: Be prepared to answer a selection of the following questions. You must be thorough, clear, and loud enough for everyone present to hear. You should use information learned from your classes during your time at FBCC in your answers and you will be allowed note cards if you choose. You may also be asked questions about your senior research project.

1. Explain the proper methodology for sampling animal and plant species in the field. Include important things NOT to do.
2. Describe the similarities and differences between traditional native versus modern views of the Earth.
3. Describe two significant influences humans have had on the environment of Fort Berthold: one good influence and one bad influence. Include the history of both and the impact it has had on the air, water, soil, and biomass on Fort Berthold, as well as the Three Affiliated Tribes.
4. Explain an environmental issue on the local, regional, and global level. Describe the issue and how you feel it should be addressed by environmentalists and lawmakers.
5. Explain how to perform an effective and complete literature search.
6. Select two regional ecosystems and explain the interdependence they have on one another. Include specific examples of how both flora and fauna species support and destabilize each other.
7. Describe ethical dilemmas that environmentalists might encounter and consider when they are performing their job.
8. Explain how the use of geospatial tools is changing the way environmental research is performed.
9. Describe how the oil drilling on Fort Berthold is affecting the water, air, and soil. Clarify how the oil contaminants are being transported through these mediums.
10. Explain how the environment has changed for the Mandan, Hidatsa, and Arikara tribe in the past 200 years and how the tribal members have dealt with it.
11. Identify and evaluate management strategies used in maintaining a local Fort Berthold species.
12. Identify and discuss factors which alter natural wildlife habitats and impact wild animal populations on Fort Berthold.
# Environmental Science Oral Capstone Rubric

<table>
<thead>
<tr>
<th>Excellent 4 points</th>
<th>Very Good 3 points</th>
<th>Average 2 points</th>
<th>Below Average 1 point</th>
<th>Poor 0 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focuses on the topic, demonstrates considerable knowledge, gives ample supporting examples/details, has a mature use of language</td>
<td>Mostly focuses on the topic, demonstrates quite a bit of knowledge, gives some supporting examples/details, has a good use of language</td>
<td>Addresses the topic, but does not go into much depth, may only give one or two supporting examples/details, does not demonstrate much knowledge on the topic</td>
<td>Loses focus on topic, may change subject of answer and elude the topic does not give any supporting details for the actual topic that should be addressed</td>
<td>Does not give any information on the topic</td>
</tr>
</tbody>
</table>

**Scores:**

<table>
<thead>
<tr>
<th>Question 1</th>
<th>Comments on Question 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 2</td>
<td>Comments on Question 2</td>
</tr>
<tr>
<td>Question 3</td>
<td>Comments on Question 3</td>
</tr>
<tr>
<td>Question 4</td>
<td>Comments on Question 4</td>
</tr>
<tr>
<td>Question 5</td>
<td>Comments on Question 5</td>
</tr>
</tbody>
</table>

**Total**
IX. PARTNERS

The Fort Berthold Community College Environmental Science Department has worked with several partners in developing and implementing research projects for the students in the program:

- TAT Environmental Division
- TAT Fire Department
- ND Research Experience for Undergrads
- ND ESPCoR
- BIA Energy Resources
- TAT Energy Department
- TAT Natural Resources
X. GRADUATE AND PROGRAM ASSESSMENT

The Environmental Science Baccalaureate Program will undergo an assessment process on an annual basis. The main components of the assessment process are the oral capstone, electronic portfolio, General Education Assessment Instrument, and graduate and employer surveys.

Oral Capstone:

The oral capstone is an examination given to students just before they graduate. They must demonstrate the knowledge that they learned while taking courses in the Environmental Science program at FBCC in order for faculty and administrators to gauge the curriculum and quality of the program.

Students are asked to combine their knowledge from the past four years to discuss and answer questions in front of a panel of faculty, administrators, and possible family members. Answers will be scored on a rubric based on areas such as depth of answers, understanding of concepts, completeness of answers, and general composition.

The appropriate program outcomes will be tagged to the questions so that they can be tracked. It will be important to follow patterns in strengths and weaknesses in program outcomes for assessment of the program. Any outcome that is consistently presented as weak across the program (multiple students, multiple assessment points), will be evaluated by the department. It will be determined whether the outcome should be revised, emphasized differently, or added to additional classes.

Electronic Portfolio:

The electronic portfolio is another method of examining whether the program outcomes are effectively learned while students are in classes at FBCC. Each student must provide two artifacts or journaling that effectively demonstrates their understanding of and meeting each program outcome during their educational experience at FBCC. There are 16 outcomes, which makes for a comprehensive look at what the students ascertained in the field of Environmental Science. The outcomes will be scored on a simple rubric that provide evidence for the department of if and how the outcomes should be revised, emphasized differently, or added to in additional classes.

The program outcomes are written in a manner to allow students to direct their learning to their particular interests. Their broad, yet defined, manner does not instruct students on what specific class or assignment they learned the outcome in, but requires thought and integration of class interests.

In addition, students must also comment on their full experience at FBCC, including extra-curricular activities, leadership, culture, and a professional resume.

General Education Assessment Instrument (GEAI):

A general education assessment exam is given to all students before they graduate with a two-year degree from Fort Berthold Community College. The exam is composed of questions from all areas of general education and is used to assess and prove that students are learning broad content knowledge. Because of the seamless 2+2 format of the A.S. and B.S. degrees,
most Environmental Science students will receive their two-year degree before moving on to their four-year degree, so they will be assessed both at this point, and when they graduate with their four-year degree. In the past, results of the GEAI have not been disaggregated into departments. However, because of the imminent Baccalaureate degrees, the results will be divided and dispersed to departments starting in 2011.

**Graduate and Employer Surveys:**
In any program it is important to gain perspective from the students on how they feel they are being educated. Fort Berthold Community College has a general survey administered to all graduating students, but the Environmental Science department will administer a specific one for its B.S. graduates.

In addition, the department will mail a survey to graduates one and two years after graduation to assess whether their education was sufficient for their current employment. Patterns in these surveys can be studied to ascertain whether changes or revisions should be made in the curriculum, particular courses, or the overall program.

Mostly, Environmental Science Faculty members will be doing the student assessment, although at times other FBCC administrators may be asked to assist. By scoring the oral capstone and electronic portfolio using rubrics, the assessments will be fair, accurate, consistent, and free of bias.

**Instructor Assessment:**
The instructors are a big part of the program and they are evaluated and undergo self-assessment on a regular basis. As with every faculty member at FBCC, there are course evaluations at the end of every course that are filled out by students. Unfortunately, the course evaluations are not specific to each department, but ask students about what they learned, how much they learned, and if culture, technology, and constructivism were integrated into the course. These are collected by the Data Manager, and copies of the anonymous results are given to each instructor for each course. This process is carried out at the end of each semester. The downfall of such course evaluations is that it does not solicit reviews from students who have dropped the course or who may not be present on the day they are given.

Each faculty member at FBCC also undergoes another evaluation process every semester called a Small Group Instructional Diagnosis (SGID). Each instructor arranges for one class at midterm to be evaluated. Another faculty member comes into the classroom and listens to and discusses the positive and negative aspects of the class so far in the semester. This method of assessment brings about very helpful and constructive criticism of the class. The evaluating faculty member then anonymously types the comments and discusses them with the instructor of the course. This is an effective way for faculty to assess what is going on in their classrooms and make positive changes during the current semester. A copy of the SGID evaluation is kept by the instructor and in/her file in the office of the Vice President of Academic Affairs.

At the end of the academic year, each faculty member meets with two colleagues and either the Vice President of Academic Affairs or the Faculty Chair. An overall evaluation is filled out based on the SGIDs from fall and spring, the course evaluations from fall and spring, and Individual Development Plan (indicating professional development, short term goals, long term
goals, strengths, and weaknesses), and an electronic portfolio created and updated by the faculty member.

At this time, course evaluations are given for full-time and adjunct faculty, however the SGID is optional for adjunct faculty. Adjunct faculty members also do not have the overall evaluation with the team of two colleagues and Vice President of Academic Affairs.
XI. MARKETING/RECRUITMENT

The Science Department at FBCC has worked at increasing its student enrollment and improving its program. Development of the Bachelor of Science degree in Environmental Science will undoubtedly attract many students who would otherwise conclude with an Associate’s degree or go off reservation to complete their Bachelor’s degree.

Because of the benefit of the National Science Foundation grant, the college has been able to use funds to bolster the initial recruitment of students to the Baccalaureate Degree, pending accreditation. Thus far it has recruited ten students to a pre-cohort who, upon accreditation, will become some of the first graduates in the program.

One reason the Science Department has been successful in its recruitment of students is because of its highly quality faculty. Dr. Kerry Hartman has worked at Fort Berthold Community College for over 25 years and is a steady source of strength in the Department. He is well known in the community, is able to connect with students, and has experience writing and administering research grants. The other science faculty members include Tom Abe who worked as an industrial chemist for over 20 years before coming to teach at FBCC, Dr. Martin Musabyimana who has a doctorate degree in Civil Engineering (Focus on Environmental Engineering), and Dr. Stacey Mortensen who has a Doctorate in Chiropractic Medicine.

Being able to offer Baccalaureate Degrees will be advantageous to help recruitment efforts of high school students. Each year Fort Berthold Community College, offers a monthly Sunday Science Academy to local high school students, as well as a Summer Science Camp. Both of these programs have been identified as successful recruitment efforts for the Science program at FBCC. High School students are able to work with the faculty, get comfortable in the facilities, and spark an interest in hands-on science experiments and projects.

An update in the science facilities has played a role in recruitment and marketing. The science classroom is currently being set up with a Smart Board, document camera, and projector. The new computerized science and GIS lab is located on the second floor of the Science and Technology Wing. It contains 15 computers and 2 GIS workstations with a plotter. The computers are utilized by numerous Science and Environmental Science classes and laboratory simulations and web-based activities. Computer Assisted Software is continually added to offer students more simulated laboratory options. The new GPS/GIS workstations have already been used on GIS classes and to assist in research projects and plans to expand its use into more coursework and research activities are underway for the future. The room is also equipped with projector capabilities for electronic presentations and student assistance. The laboratory is not new, but has four lab benches, a ventilation hood, and the subsequent equipment and glassware. The Land Lab that is located three miles west of campus on Army Corps of Engineers land and is 7.2 acres in size is attractive to students who prefer to perform research outdoors. The Land Lab has two Juenberry research plots and provides a site for students to conduct research. There are also seven plots (4.2 acres) that are irrigated and a Traditional Garden is planted in a Mandan, Hidatsa, Arikara configuration utilizing traditional seeds provided by the Tribes.

Aside from the cohort, the number of Fort Berthold residents expressing interest in the program is increasing, despite FBCC’s inability to fully advertise and market the B.S. degree. Once accreditation is granted, the department plans on fully disclosing the Environmental...
Science program with advertisement, newspaper coverage, person-to-person recruitment, high school fairs, and brochures and posters. FBCC expects to get a considerable number of students taking upper division courses, both full time in the program and part-time, especially because tribal employees are allowed a certain number of administrative leave hours per week used for attending classes to further their education in their field.
XII. BUDGET

Although several programs continue to be funded through grants including the Environmental Science program, Fort Berthold Community College is fiscally sound and up to date on the financial audits. The college is very progressive at applying for and obtaining outside funding sources in program areas that offer a unique and essential component to the reservation, especially those in the STEM fields.
XIII. MISCELLANEOUS POINTS OF IMPORTANCE

1. How does the program maintain records of formal candidate complaints and their resolutions?

   The following is the Student Grievance Policy found in the FBCC Academic Catalog/Student Handbook (as mentioned above):

<table>
<thead>
<tr>
<th>Grievance Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following steps apply in all cases where the Fort Berthold Community College conducts a grievance hearing over student, staff, or faculty at Fort Berthold Community College.</td>
</tr>
</tbody>
</table>

   a. Initiation of Complaint
   Any member of Fort Berthold Community College community, or other individual who has been impacted by the alleged behavior of a student, staff, or faculty member, may initiate a complaint by contacting the offices of Academic Dean or Dean of Students. Before actions may be taken, the complaint must be submitted in writing. While anyone may submit a complaint, the Fort Berthold Community College determines whether a hearing will occur. In all cases, Fort Berthold Community College is the formal complainant.

   b. Notification of the accused
   A student, staff or faculty member, violating college policies will be notified in writing of the nature of the allegations, the policies allegedly violated, and the possible sanctions. The notification will be sent to the local address.

   c. Preliminary Conference
   An accused student will meet with the Dean of Students or Academic Dean in a preliminary meeting, the purpose of which is to ensure that the student understands the disciplinary process and his/her due process rights. Failure to attend a preliminary conference meeting will result in a formal hearing to be scheduled. The student may request one change in date and time of preliminary meeting by requesting it 24 hours in advance of the scheduled conference.

   d. Informal Resolution Process
   In conjunction with the preliminary meeting, the Dean of Students or Academic Dean shall offer the accused student an opportunity to informally resolve the alleged violation. This will involve a review of the incident and discussion of the applicable sanctions, if the accused student acknowledges responsibility for the violation. The student has three class/business days from the date of signing the informal resolution agreement to reconsider the agreement and request a formal hearing. The outcome of an informal resolution cannot be contested after three class/business days have elapsed. There are no appeals. The outcome of a formal hearing will replace the agreement reached through the informal resolution.

   e. Formal Resolution Process
   Cases that cannot be resolved informally will proceed to a formal hearing. The case will be assigned to hearing committee appointed by the Dean of Students and the Academic Dean. Accused students who fail to appear for a hearing after proper notice will be adjudicated in their absence based on the evidence presented at the time of the hearing. The outcome of a formal hearing must be communicated to the accused in writing.
2. In what ways does the program regularly and systematically use data to evaluate the efficacy of and initiate changes to its courses, programs, research projects, and internships?

   The program analyzes the data it collects on a regular basis. The program obtains assessment data from faculty evaluations, the oral capstone, electronic portfolios, internships, general education assessment instruments, and graduate and first/second year surveys. When the data is collected, it will be put into a database that will be able to aggregate and disaggregate the information for analysis of the program.

3. Who are the program's partners in the design, delivery, and evaluation of the program's research projects and internships?

   The Environmental Science program will work with various partners for research projects and internships. Students are encouraged to follow their interests when working with the FBCC faculty to get assigned to an internship or start a research project. FBCC has relationships with the following partners:
   - TAT Environmental Division
   - TAT Fire Department
   - ND Research Experience for Undergrads
   - ND ESPCoR
   - BIA Energy Resources
   - TAT Energy Department
   - TAT Natural Resources

   Most students work on research projects throughout the academic year in order to prepare a project for the AIHEC competition in March. They present a poster and give an oral power point presentation on their results and research methodologies.

   FBCC is fortunate enough to also have long standing research projects that many interns have worked on over the years. These longer research projects enable students to see what goes into projects over a longer time frame and more in-depth.

4. How does the program systematically ensure that students use technology as a learning tool during coursework, research projects, and internships?

   Technology is naturally paired with the FBCC Environmental Science Program. The students use technology in projects and assignments in GPS/GIS/RS navigation, literature reviews, paper writing, power point presentations, lab analysis, field experiments, and electronic portfolios. Every course at FBCC includes technology and by the time students are ready to graduate, they will be well trained in multiple technological areas.

5. How are faculty evaluations used to improve teaching, scholarship, and service?

   Every year as part of their evaluation, faculty members must fill out an Individual Development Plan, as directed by the Vice President of Academic Affairs. The Individual Development Plan is a tool for faculty to track their professional development, strengths, weaknesses, and short and long term goals. The professional development will indicate, by
year’s end, if they grew at a professional level. The strengths and weaknesses should point the
instructor in a direction the following year towards possible professional and personal
development. At the overall evaluation at the end of the academic year with two colleagues
and either the Vice President of Academic Affairs or the Faculty Chair, the short term and long
term goals from the previous year’s Individual Development Plan are revisited to check that
there has been progress.

As dictated in the Faculty Handbook, instructors at FBCC have academic freedom in their
classrooms. How instructors decide to interpret and utilize the comments from the SGIDs and
course evaluations is ultimately up to them. It should be evident through the evaluation
process at the end of the academic year if improvements in teaching, scholarship, and service
are necessary.

6. What are the program's recruiting and admissions policies? How does the program
ensure that they are clearly and consistently described in publications and catalogues?

FBCC recruits students by putting a full page ad in the local newspaper every semester,
renting a billboard in town for one month out of the year, offering classes and trainings to local
businesses and organizations, putting a course schedule in all of the local post office boxes
every semester, visiting area high schools, participating in local parades and events, speaking
on the New Town radio station, and more. Specific programs, such as Environmental Science
have put flyers around FBCC and around town,

printed articles/advertisements in the FBCC newsletter and area newspapers, gave presentations at FBCC events, and through direct
recruitment to current students in the A.S. Science and A.S. Environmental Science Programs.

The Director and faculty of the Environmental Science Program inspect all college
publications that contain information about the program, mainly the college website and
catalog. The Environmental Science Department decides what information is printed and can
rectify any incorrect material.

7. How does the program ensure that students have access to student services such as
advising and counseling?

Because of the size of FBCC, the students in the Environmental Science program have
advising and counseling readily available to them from any of the following: Director of the
Environmental Science Program, the faculty in the department, the Vice President of Academic
Affairs, the Dean of Student Services, and the retention counselor. The retention counselor is a
full time employee whose main priority is to ensure that students are succeeding at FBCC. She
assists students in any way they need, including advising, finding funding, mediating between
students and faculty, and encouraging them to continue on the right path. Candidates know
that all staff and faculty have an “open door policy.” They can seek advising and counseling any
time they want or need. The program is designed using the cohort model to successfully
ensure continued support from each other throughout their continued educational experience.

8. Which members of the professional community participate in program design,
implementation, and evaluation? In what ways do they participate?

The professional community has a great deal of input in the Environmental Science
program. Elders have given input and will be asked in the future for contribution on coalescing
science and culture. Intern supervisors evaluate and assist in research projects, as well as contribute to environmental science seminars and cohort activities.

9. **How does the program facilitate collaboration with other academic programs involved in the preparation of baccalaureate graduates?**

FBCC is a community school that focuses on the student as the number one priority and each academic department works together for the betterment of the students. The semester schedule, student handbook, and catalog are created collaboratively with contribution from all faculty members. The addition of baccalaureate programs to FBCC will be a major concern and focus of the academic department to increase the variety and services to the students.

10. **What are the institution's and program's workload policies? What is included in the workloads of faculty (e.g., hours of teaching, advising of candidates, supervising student teachers, work in P-12 schools, independent study, research, administrative duties, and dissertation advisement)?**

As stated in the FBCC Faculty Handbook:

<table>
<thead>
<tr>
<th>Faculty Load</th>
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<tr>
<td>The normal teaching load for a faculty member shall be not less than twelve (12) credit hours nor more than sixteen (16) credit hours each semester. Should the faculty member’s teaching load become less than twelve (12) credit hours due to a lack of enrollment or circumstances beyond the control of either the faculty member or the college, the faculty member shall be assigned special projects by the college during the contract period. Should a faculty member’s load be more than sixteen (16) credit hours, he/she will be compensated at the same established fixed per credit hour as part-time faculty. Practicum courses not meeting the minimum class size (see 2.1M) are not counted toward the 12-credit minim load, but will be paid as overload if: 1) they produce a load of more than 16 hours, and; 2) the students enrolled require the course in order to graduate that academic year.</td>
</tr>
</tbody>
</table>

In addition, as stated in the FBCC Handbook:

<table>
<thead>
<tr>
<th>Faculty Responsibilities:</th>
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</thead>
<tbody>
<tr>
<td><strong>To the College:</strong></td>
</tr>
<tr>
<td>• To satisfactorily carry out duties and responsibilities as agreed upon in the individual contracts.</td>
</tr>
<tr>
<td>• To be committed to scholarship which will enrich instruction</td>
</tr>
<tr>
<td>• To provide data and information for the purpose of Assessment, or for completion of Reports to granting bodies or other agencies.</td>
</tr>
<tr>
<td>• To participate in:</td>
</tr>
<tr>
<td>Faculty meetings</td>
</tr>
<tr>
<td>Faculty workshops</td>
</tr>
<tr>
<td>Major academic events</td>
</tr>
<tr>
<td>Staff or faculty development projects or studies</td>
</tr>
<tr>
<td>Co-Curricular activities</td>
</tr>
<tr>
<td>Student advising</td>
</tr>
<tr>
<td>• To cooperate in promoting safety and the care of college property.</td>
</tr>
<tr>
<td>• To direct individual learning projects and or/independent studies according to contract form.</td>
</tr>
<tr>
<td>• To uphold the mission, values, and goals of the College.</td>
</tr>
</tbody>
</table>
11. To what extent do workloads and class size allow faculty to be engaged effectively in teaching, scholarship, and service (including time for such responsibilities as advisement, developing assessments, and online courses)?

The faculty load is set forth as such so that faculty members have time to teach their courses, advise students and work on assessment. Class sizes in the Science Department are usually not more than ten students. If faculty members develop an on-line course, he/she is compensated separately as it is developed outside of work hours. If an on-line course is taught, the credits apply equally to the teaching load as a regular course.

12. What financial support is available for professional development activities for faculty?

FBCC shares certain resources among departments and disciplines. There are line items earmarked in the general fund specifically for professional development of faculty. In addition, the college has secured grants in different disciplines which direct part of the funds to be used for professional development. The professional development that is brought to the college is always offered to and often mandated for all faculty members. This allows for the most economic and efficient means for professional development of faculty. The Vice President of Academic Affairs makes professional development a priority in order to keep faculty abreast of the current teaching methods, research and the best practices in education.

13. What information technology resources support faculty and students? What evidence shows that students and faculty use these resources?

FBCC mandates that instructors incorporate technology into every class that is offered. The main classroom management system that the college utilizes is Blackboard. From this internal center, the students can go on-line and have access to their course documents, grades and assignments. Research is an integral element of many courses at FBCC and information technology training is offered to students in required Psychology of Student Success course, student orientation and by request of faculty in their classes. The library has 55 on-line databases to support faculty and candidate research. There are four computer lab classrooms on campus, as well as computers for student use located throughout the college. Access to the library webpage and its on-line databases is available from any of these computers, via campus-wide connection or from home using a password that is available to FBCC student and staff. In a push toward technology literacy, faculty members are encouraged to include information technology and literacy in each of their courses. Therefore, almost all faculty members required use of the information technology resources that the library has available to students. For example, students must retrieve journal articles written on their topic of interest from the on-line databases.

14. How does the program ensure the accessibility of resources to candidates, including candidates in off-campus, distance learning, and alternate route programs, through electronic means?

FBCC offers classes over its CLAN system to students in the outlying reservation communities of White Shield and Mandaree. Each semester it is mostly general education
classes that are offered in this fashion in order to reach the largest amount of students. There are also classes offered hybrid or online, but again, these are mostly general education courses. Because of the hands-on manner that upper level Environmental Science courses are offered, these classes are not offered over the CLAN or via hybrid or online methods.

15. **How was the conceptual framework developed and who participated in the development and possible revisions of the conceptual framework?**

   The conceptual framework was developed by the Environmental Science faculty. Each member, as well as the Vice President of Academic Affairs read the first draft and gave input. One of the important factors of the importance of the success of the baccalaureate program is coherence by every member and continuity of the procedures.
Appendix A:

Curriculum Vitae of Faculty Members
Resume
Kerry E. Hartman
Box 907
New Town, ND 58763

Professional Preparation:

South Dakota State University  Biological Sciences  PhD  2009
University of California-Berkeley  Natural Resources  Graduate Study  1996
Colorado State University  Natural Resource Mgmt.  Graduate Study  1996
Montana State University  Science Teaching  Graduate Study  1991
Montana State University  Multi-Cult. Ed/Computers  Graduate Study  1987
University of North Dakota  Public Administration  Graduate Study  1981
University of North Dakota  Secondary Teaching  Certification  1980
University of Illinois  Guidance & Counseling  Masters of Ed.  1975
University of Illinois  Psychology  Bachelors of Arts  1973

Appointments:

Math/Science Instructor  Fort Berthold Community College  6/1992-Present
Interim College President  Fort Berthold Community College  10/2004-8/2005
Adjunct Math/Science Instructor  Fort Berthold Community College  1982-1992
Math/Science Instructor  White Shield High School  1982-1981
INMED Counselor  University of North Dakota  Summers 1979-81
Upward Bound  University of North Dakota  Summers 1976-77

Administrative Experience:

Project Director  NSF/TCUP  2010-2015
Project Director  NPUARC grant  2006-2011
Project Director  USDA/CSREES  2006-2010
Project Coordinator  EPSCoR/NAUTRE  2006-2010
Project Director  BRIN Grant  2002-2004
Project Director  NRE Grant  2002-2006
Project Director  Aquaculture Grant  2002-2006
Project Director  AMP Grant  1995-1997
Project Director  Hewlitt Packard Grant  1994-1998
Project Director  MSIP Program  1993-1996
College Coordinator  INMED Program UND  1981
Asst. Director  INMED Program UND  1977-1981
Community Counselor  Turtle Mountain Reservation  1976-1977
**Conferences and Workshops:**

Higher Learning Commission  
American Indian Higher Education Consortium  
Native Peoples/ Native Homelands  
Northern Plains Undergraduate Research Consortium  
AIHEC Science Competition Coordinator-2003  
National Science Teachers Association  
National Council of Teachers of Mathematics  
North Dakota Science Teachers Association  
Inservice: Discipline, Learning Disabilities, Classroom Computers, Computers for Teaching  
North Dakota Education Association  
National Indian Education Association-1978, 1979 (Workshop coordinator 1981)  
National Indian Health Board-1978-1979  
North Dakota Indian Education Association-1977-1980  

**Honors:**

Accepted into Gamma Sigma Delta Honor Society of Agriculture-SDSU- April 19, 2005  
Accepted into PhD Degree program at SDSU  
Selected to Participate in National Science Foundation Science Teachers Program  
Summers at Montana State University  
Upward Bound Service Award  
INMED Service Award  
North Dakota Indian Education Association, Outstanding Achievements in Counseling- 1979
Martin Musabyimana  
1133 27th Street N

Fargo, ND, 58102  
Email: mmusab@fbcc.bia.edu  
Tel: (701) 627-4738, Ext 286

EDUCATION

▪ PhD, Civil Engineering (focus on Environmental Engineering) (2008),  
  Virginia Polytechnic Institute and State University, Virginia, USA  
▪ MEng, Civil Engineering, emphasis on Environmental Engineering (2005),  
  City University of New York, New York, USA  
▪ BSc, Civil Engineering & Environmental Technology (2003),  
  Kigali Institute of Science and Technology (KIST), Kigali, Republic of RWANDA

RECOGNITION

▪ Mondialogo Engineering Award Winner, UNESCO-DAIMLER, 2007  
▪ Sussman Fellowship, 2006  
▪ School of Engineering Citation, City University of New York, 2005  
▪ Scholarship of excellence offered to top three Engineering Students by the City College of CUNY to Kigali Institute of Science and Technology, 2004.

RELEVANT EXPERIENCE

Environmental Science Faculty, Fort Berthold Community College, New Town, North Dakota, ND (01/16/2010-Today)  
▪ Teach Environmental Science classes to Undergraduate students  
▪ Advise students enrolled in Environmental Science program

Postdoctoral Research Associate, City University of New York at City College, New York, NY (11/2008 – 12/31/2009)  
▪ Designed and run laboratory experiments to understand the kinetics of nitrogen removal processes in wastewater treatment plants, specifically the anaerobic ammonia oxidation (anammox) process.  
▪ Used the computer model to simulate and optimize the Wards Island Water Pollution Control Plants (New York) process performance  
▪ Presented the findings in workshops
**Research Assistant, Deammonification Project, DC Water and Sewer Authority, Washington DC and Alexandria Sanitation Authority, VA (06/2005-08/2008)**
- Managed day-to-day operations of a deammonification pilot plant hosted by the Alexandria Sanitation Authority, Virginia
- Performed diagnostic and stress tests on the pilot plant
- Provided bi-weekly updates in conference calls involving multiple entities (Alexandria Sanitation Authority, District of Columbia Water and Sewer Authority, CH2M Hill, Envirosim, University of Innsbruck and Virginia Polytechnic Institute and State University)
- Prepared and presented results in workshops

**Teaching Assistant, Environmental Chemistry, Virginia Polytechnic Institute and State University, Blacksburg, VA (08/2005-01/2006) and City College of New York (2009)**
- Held office hours to support Civil Engineering graduate students in Environmental Chemistry class
- Participated in class preparation and paper grading for Environmental Chemistry class

**Research Assistant, Biological Nitrogen Removal Project, Research Foundation, City University of New York (06/2004 – 08/2005)**
- Designed and performed laboratory experiments to determine the key kinetics and stoichiometric parameters of 5 large water pollution control plants in New York City. The plants include: Wards Island, 26 Ward, Tallmans Island, Bowery Bay and Hunts Point.
- Conducted several field experiments including the dye study to understand mixing effects in aeration zone in 26 Ward and the settling experiments to model the secondary clarifiers in Wards Island.

**Relevant Language Skills:**
English, French, Kinyarwanda, Swahili

**Relevant Computer Skills:**
Microsoft Office, BIOWIN, AUTOCAD, ArcView, Matlab, Instant Engineer, HEC-HMS, AQUASIM
Publications, Conference Proceedings and Presentations


- O’Shaughnessy, M; Musabyimana, M; Sizemore, J; Murthy, S; Wett, B; Takacs, I; Houweling, D; Sanjines, P; Love, N; Pallansch, K (2008), Operations and Process Control of the Deammonification Process as a Sidestream Option for Nutrient Removal, *Water Environmental Federation Technical and Exhibition Conference*, , Chicago, IL

Stacey M. Mortensen, DC  
8375 B 38th St. NW · New Town, ND 58763
701-627-2447 - h  
701-629-0452 - c  
smorte@fortbertholdcc.edu

Education

Doctor of Chiropractic, December 2003; Western States Chiropractic College: Portland, OR;  
gr graduated magna cum laude

Bachelor of Science in Chemistry, May 1999; University of North Dakota: Grand Forks, ND;  
gr graduated magna cum laude

Experience

Fort Berthold Community College  
New Town, ND  
June 2010 - present

 Director of Doka Hog Mahoo – Environmental Science program  
   Administer the Doka Hog Mahoo five year grant from the National Science Foundation  
   Execute the accreditation process of a baccalaureate degree in Environmental Science  
   Instruct various courses in the area of science and mathematics  
   Advise Environmental Science cohort students

Fort Berthold Community College  
New Town, ND  
August 2008-June 2010

 Instructor in the Department of Teacher Education  
   Instruct various courses in the area of science and teacher education  
   Advise Teacher Education cohort students  
   Execute the accreditation process of a baccalaureate degree in Elementary Education  
   Assist with the set-up and accreditation of a baccalaureate degree in Environmental Science

Northern Star Gifts  
New Town, ND  
May 2007-September 2008

 Owner and manager of gift store

University of Mary  
Bismarck, ND/New Town, ND  
May 2007-December 2007

 Health/Nutrition adjunct instructor

Fort Berthold Community College  Environmental Science  Page 49 of 73
Fort Berthold Community College
New Town, ND
- Science and Natural Resources instructor
- Taught various science courses on Fort Berthold Reservation
- Planned and coordinated natural resource activities including Sunday Academy and Culture Center Nature Park.
- Implemented technology, culture and constructivism in college classroom
- Advised the FBCC Science Club (composed of SEEDS & AISES)

Mortensen Chiropractic
Stanley, ND and New Town, ND
- Part-time chiropractor
- Enjoyed teaching patients about their own anatomy in context to their chiropractic concerns

Western States Chiropractic College
Portland, OR
- Gross anatomy tutor
- Helped students individually or in groups understand anatomy via notes and in the human cadaver lab
- Patient case simulator/tutor

ScanlanKemperBard Companies
- Administrative Assistant

University of North Dakota
Grand Forks, ND
- Laboratory teaching assistant
- Taught multiple chemistry laboratories, including one for nursing students

Grant Work

Mada Maagarishtauo Awa Hee Aadsa Maa Aru Maa Giguckiigash (The ones that teach our children how everything on this earth works)
- Funding: National Science Foundation
- Role: Science Teacher Education faculty
- Grant Objective: initiate a baccalaureate degree for American Indian/Alaskan Native students in Elementary Education with an emphasis in math and science in order to build students’ knowledge base in those subjects to improve the transition to middle and high school math and science
A Land Grant Network to Enhance Tribal College Community Natural Resource Education Programs

- Funding: USDA IFAFS Program
- Partners: Iowa State University, North Dakota State University, South Dakota State University, University of Nebraska-Lincoln, Sitting Bull College, Sinte Gleska University, Nebraska Indian Community College
- Role: Natural Resource Instructor
- Grant Objectives: acquire, analyze, prioritize and conduct community-based outreach in the area of natural resources; strengthen natural resource programs at the four Tribal Colleges; build a consortia of partnerships which connect 1994 tribal colleges and 1862 land-grant institutions

High School Sunday Academy ‘Science, Math, Engineering & Technology’ Program

- Funding: North Dakota Experimental Program to Stimulate Competitive Research (NDEPSCoR)
- Partners: North Dakota State University, Turtle Mountain Community College, Cankdeska Cikana Community College, Sitting Bull College
- Role: Instructor
- Grant Objective: through the collaboration of NDSU and the ND tribal colleges, design a standards-based, but hands-on academic curricula for Native American high school students

SEEDS Special Project Grant

- Funding: Ecological Society of America’s SEEDS (Strategies for Ecology Education, Development, and Sustainability)
- Role: author and coordinator of the second addition of the grant
- Grant Objective: create a nature park around FBCC’s Culture Center integrating plant identification, honorarium to tribal elders and a leisure area

Presentations

The Collaboration for the Advancement of College Teaching and Learning

- February 19-20, 2010
- Title of Presentation: “Big Time Assessment at a Small College”

Professional Organizations

National Council of Teachers of Mathematics
National Science Teachers Association
North Dakota Council of Teachers of Mathematics
North Dakota Science Teachers Association
Thomas Anthony Abe  
1003 Center Drive  
Hazen, North Dakota 58545  
Home: 701-748-5469  Cell Phone: 701-880-0300

EDUCATION


1976 – 1978  Medical Student, Third year of Medicine, Passed Part I of National Medical Boards, University of Colorado Medical Center, Denver, Colorado

1973 - 1976  Bachelor of Science in Medicine, University of North Dakota, Grand Forks, North Dakota

1963 - 1968  Bachelor of Arts, Chemistry, Minot State College, Minot, North Dakota

1959 - 1963  High School Parshall, Parshall, North Dakota

EDUCATION RELATED APPOINTMENTS

1982  INMED Program, University of North Dakota School of Medicine, Summer Institute Staff, Grand Forks, North Dakota
1) Instructor-Counselor (college credit course for high school seniors as a health profession enrichment training program
2) Medical student entry training program coordinator

1981  Gifted and Talented Program, Guest Speaker on the Uses of Plants and Folk Medicine in Contrast with the modern treatment of Common Diseases, Co-sponsor with Roger Grey Eyes, MD, HIS Clinical Director

MILITARY

1968 - 1970  U.S. Army Infantry, Rank: Spec 4
United States Army - Honorable Discharge - Bronze Star
Duty Station: Viet Nam Tour of Duty, Light Weapons Infantry
WORK EXPERIENCE

1987 - 2006  Lab Technician V
Dakota Gasification Company at Beulah, North Dakota parent company Basin Electric Cooperative
Duties: Analyze liquids, solids and gases produced and associated with coal conversion to natural gas also back-up Lab Supervisor

1985 - 1987  Lab Technician IV
American Natural Gas at Beulah North Dakota
Duties: Analyze and develop special and routine lab procedures for process analysis and Products

1984 - 1985  Lab Technician III
Great Plains Gasification Associates at Beulah North Dakota
Duties: Lab analysis of routine and special process and product material

1981 - 1984  Math Science Instructor
Fort Berthold Community College, New Town, North Dakota
Duties: Full-time instructor for community college students teaching physical sciences, mathematics, environmental sciences and health science courses in Pharmacy, Human Anatomy and Physiology Assisted in planning and implementing a standard science laboratory for the college’s General Chemistry Courses

Summer 1980  Science Instructor
Argonne Program, Department of Energy, Natural Resources Training Program, Fort Berthold Community College, New Town, North Dakota
Duties: taught energy development related courses to selected pre-college students

1979 - 1980  Health Planner
Three Affiliated Tribes, New Town, North Dakota
Duties: Coordinated and completed IHS Comprehensive Tribal Specific Health Plan to conform to public law (Pl. 94 - 437) involving health manpower and contract health requirement calculations (RAC) Coordinate and implement the Health Care Improvement Act’s Medicaid Reimbursement Policy and Tribal Health Funding Proposal

1972 - 1973  Physician Assistant
Indian Health Service, Mini-Tohe Clinic, New Town, North Dakota
Duties: Physician Assistant to the Medical Officer of the Mine-Tohe Clinic researched patient medical records, requested lab workups, standing orders for hospital admissions physical exams, medical consultations and referrals

1972 - 1973  Chemist Technician
Northwestern Memorial Hospital, affiliated with the Northwestern University Clinical Pharmacology Department, Chicago, Illinois
Duties: Developed methods published clinical pharmacological research for cardiac and epileptic patient care

1970 – 1972  Lab Supervisor
Quality Control Laboratory, Sucrex Corporation, Chicago, Illinois
Duties: Supervised lab personnel (ten technicians) in the analysis of process and products related to the liquid sugar refinery
WORK RELATED APPOINTMENTS

1982 Minority Science Improvement Program, Chemistry Lab Development Coordinator, Fort Berthold Community College, New Town, North Dakota
1981 Gifted and Talented Program, Guest Speaker on The Uses of Plants and Folk Medicine in Contrast With Modern Treatment of Disease with Dr. Roger Grey Eyes, Mini-Tohe IHS Clinical Director

PUBLICATIONS

1979 Diabetes among the Three Affiliated Tribes: Correlation with Degree of Indian Inheritance, American Journal of Public Health 69:1277-1278, 1979 Authors: James Brosseau, MD, Robert C. Eelkema, MD, Andrea Crawford, MD and Thomas A. Abe, BS

PERSONAL

Age: 61 Health: Excellent
Marital Status: Married, 2 dependants

Hobbies: Camping, country hiking, jogging, traveling, reading, attending computer club meetings when available and some community meetings

Interests: Microcomputers, Linux, online projects, workstation administration, science topics, energy and environmental development planning, health care and electronic medical records development, philosophy, movies, home building projects, gardening, world events, ancient world and Native American history, traveling, good coffee and conversation
APPENDIX B:

Intern Packet Forms
Environmental Science Internship

Description:
Science Internships are designed to give students experience in their chosen career field and are an extension and application of prerequisite academic skills. These internships are open to all Environmental Science majors in good standing with the college. Internships involve hands-on experiential learning in a variety of host organizations. Ideally, internships are pre-professional and project based experiences allowing students the opportunity to make meaningful contributions to the organization while conducting research. Students should be both supported and challenged, and encouraged to take initiative and develop life-long learning skills. Each intern works under a site supervisor at the host organization and a Faculty mentor from the College. The role of the site supervisor is to collaborate with FBCC Science Faculty to oversee the student experience and research activities. The role of the FBCC Faculty member is to provide mentorship throughout the internship for both job related and research related activities. The site supervisor, Intern, and Faculty mentor each complete regularly scheduled evaluations and conduct weekly meetings during the internship. Internship progress and problems are discussed during these meetings. A final assessment instrument is completed by all involved upon completion of the internship.

Objectives:
Students who successfully complete an internship should be able to both write and articulate:

- The mission of the host organization and how the mission is carried out by people within the organization
- The skills and attributes needed for the potential career
- How he/she can make a positive contribution to the work of the organization
- Have a thorough understanding of potential and related career options
- Work assigned hours and follow expectations similar to those of employees and/or other interns
- How to design and conduct a research project related to work at the organization

Academic Outcomes for Internships:

1. DEMONSTRATES DISCIPLINE DEPARTMENTAL OUTCOMES IN THE WORK SETTING.
   a. Articulates disciplinary outcomes and identifies specific discipline frameworks relevant to the work situation.
b. Searches out and professionally uses appropriate disciplinary resources and methods to accomplish his/her required tasks.

2. USES WORK EXPERIENCE TO FURTHER DEVELOP DISCIPLINE KNOWLEDGE AND OUTCOMES.
   a. Articulates how work experience enhanced understanding and use of discipline theories.
   b. Provides evidence as how his/her work experience has led to increasing sophistication in demonstrating discipline outcomes.

3. DEMONSTRATES PROFESSIONALISM
   a. Identifies and describes professional expectations within the organization and acts accordingly.
   b. Describes the relationship between organizational expectations and professional standards.
   c. Successfully completes the mentor and supervisor’s internship work goals.
   d. Works efficiently and effectively.

4. SUCCESSFULLY COMPLETES THE REQUIREMENTS OF THE ACCOMPANYING SEMINAR OR MONITORING FACULTY MEMBER.

Assignments:
1. Attend an Orientation session prior to the start of your internship
2. Weekly journaling and reflection
3. Weekly Activity Reports with signatures of site supervisor and FBCC faculty mentor
4. Weekly cohort meeting: EVERY Wednesday at 1:00
5. Two Informational Interviews with professional staff at the organization or a partner organization (see schedule below). In lieu of journaling and reflection during week 6 and week 10, you will compose a 2-3 page paper detailing the interview.

Schedule:
The following schedule lists what your weekly journaling should reflect. You are expected to take 10 minutes out of every day (Monday through Friday) to journal about your experience – whether or not you report to your site supervisor. The journal entries must be turned in weekly during the cohort meeting for the previous week.

<table>
<thead>
<tr>
<th>Week 1: May 31-June 4</th>
<th>Orientation session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2: June 7-11</td>
<td>Journaling and reflection on what you expect to gain from your summer internship</td>
</tr>
<tr>
<td>Week 3: June 14-18</td>
<td>Journaling and reflection on mission, values, etc. of internship workplace</td>
</tr>
<tr>
<td>Week 4: June 21-25</td>
<td>Journaling and reflection on self, values, and the experience</td>
</tr>
<tr>
<td>Week 5: June 28-July 2</td>
<td>Journaling and reflection on challenges you are facing; Mid-term evaluation by site supervisor to be completed</td>
</tr>
<tr>
<td>Week 6: July 5-9</td>
<td>Paper on first informational interview with professional staff at the organization or partner organization</td>
</tr>
<tr>
<td>Week 7: July 12-16</td>
<td>Journaling and reflection on accomplishments so far in your internship</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>Week 8: July 19-23</td>
<td>Journaling and reflection on diversity in the organization</td>
</tr>
<tr>
<td>Week 9: July 26-30</td>
<td>Journaling and reflection on type of work in this field and if you think it is a good fit for you</td>
</tr>
<tr>
<td>Week 10: August 2-6</td>
<td>Paper on second informational interview with professional staff at the organization or partner organization; Final Evaluation given to site supervisor to be completed</td>
</tr>
<tr>
<td>Week 11: August 9-13</td>
<td>Journaling and reflection on if and how the internship did or did not meet your expectations</td>
</tr>
</tbody>
</table>

**Site Supervisor Evaluations**
Evaluations will be provided during week 5 and week 10 to your site supervisor. Your site supervisor will return the evaluation to the FBCC Science Department and a copy will be sent to your faculty mentor and the original will be placed in your internship file.
FBCC Science Department

INTERNSHIP JOB DESCRIPTION

Student Intern: ____________________________________________

Student Schedule at Site:
Day: __________ Hours: _________
Day: __________ Hours: _________
Day: __________ Hours: _________

Site: ____________________________________________________

Site Supervisor: __________________________________________

Title: ____________________________________________________

Phone: ____________________________________________________

Beginning Date: _____________ Ending Date: _____________

Title for Student Intern: ____________________________________

<table>
<thead>
<tr>
<th>WORK GOALS: WHAT DO I WANT THE STUDENT TO ACCOMPLISH?</th>
<th>WHAT SPECIFIC TASKS WILL THE STUDENT DO TO ACHIEVE EACH GOAL?</th>
<th>WHAT IS THE TIMELINE OR DUE DATE FOR THESE TASKS?</th>
<th>WHAT RESOURCES WILL I PROVIDE TO HELP THE STUDENT?</th>
</tr>
</thead>
</table>

SIGNATURES: Student: ____________________________________________ Mentor: ____________________________________________ Date: _____________

MENTOR: Please complete this form at the first meeting with student. You and student both sign. Please send original to FBCC Science Department. Make a copy for yourself and one for the student.
Name: __________________________

Fort Berthold Community College
Doka Hog Mahoo

Internship Activity Report

Week 1: May 31-June 4

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<tr>
<th>Date/ Times</th>
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Total Hours: ________________

Supervisor Signature: __________________________ Date: ________________

FBCC Faculty Mentor: __________________________ Date: ________________
Name: __________________________

Fort Berthold Community College  
Doka Hog Mahoo

Internship Activity Report

Week 2: June 7-11

<table>
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<tr>
<th>Date/ Times</th>
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Total Hours: ________________

Site Supervisor Signature: _____________________________________ Date: ______________

FBCC Faculty Mentor: ________________________________________ Date: ______________

*Assignment: Journaling and reflection on what you expect to gain from your summer internship
## Internship Activity Report

### Week 3: June 14-18

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<tr>
<th>Date/ Times</th>
<th>Activities Completed</th>
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Total Hours: ________________

Site Supervisor Signature: ___________________________ Date: _____________

FBCC Faculty Mentor: _________________________________ Date: ______________

*Assignment: Journaling and reflection on mission, values, etc. of internship workplace*
Name: __________________________

Fort Berthold Community College
Doka Hog Mahoo

Internship Activity Report

Week 4: June 21-25

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<tr>
<th>Date/ Times</th>
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Total Hours: ________________

Site Supervisor Signature: ____________________________ Date: _____________

FBCC Faculty Mentor: ____________________________ Date: _____________

*Assignment: Journaling and reflection on self, values, and the experience
**Internship Activity Report**

**Week 5: June 28-July 2**

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<th>Date/ Times</th>
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Total Hours: ________________

Site Supervisor Signature: ____________________________ Date: _____________

FBCC Faculty Mentor: ____________________________ Date: _____________

*Assignment: Journaling and reflection on challenges you are facing; Mid-term evaluation by site supervisor to be completed*
Name: __________________________

Fort Berthold Community College
Doka Hog Mahoo

Internship Activity Report

Week 6: July 5-9

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<tr>
<th>Date/ Times</th>
<th>Activities Completed</th>
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Total Hours: ________________

Site Supervisor Signature: ____________________________ Date: ____________

FBCC Faculty Mentor: ____________________________ Date: ____________

*Assignment: Journaling and reflection on first informational interview with professional staff at the organization or partner organization
Name: __________________________

Fort Berthold Community College  
*Doka Hog Mahoo*

Internship Activity Report

**Week 7: July 12-16**

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<th>Date/ Times</th>
<th>Activities Completed</th>
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Total Hours: __________________

Site Supervisor Signature: ___________________________  Date: ___________

FBCC Faculty Mentor: ___________________________  Date: ___________

*Assignment: Journaling and reflection on accomplishments so far in your internship*
**Name:** ______________________

Fort Berthold Community College  
*Doka Hog Mahoo*

**Internship Activity Report**

**Week 8: July 19-23**

<table>
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<th>Date/ Times</th>
<th>Activities Completed</th>
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**Total Hours: ________________**

**Site Supervisor Signature:** ________________________________  Date: _____________

**FBCC Faculty Mentor:** ________________________________________  Date: ______________

*Assignment: Journaling and reflection on diversity in the organization*
Name: ________________________

Fort Berthold Community College
Doka Hog Mahoo

Internship Activity Report

Week 9: July 26-30

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<th>Date/ Times</th>
<th>Activities Completed</th>
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Total Hours: ________________

Site Supervisor Signature: ___________________________ Date: _____________

FBCC Faculty Mentor: ___________________________ Date: _____________

*Assignment: Journaling and reflection on type of work in this field and if you think it is a good fit for you
Name: __________________________

Fort Berthold Community College
Doka Hog Mahoo

**Internship Activity Report**

**Week 10: August 2-6**

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<tr>
<th>Date/ Times</th>
<th>Activities Completed</th>
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</table>

Total Hours: ______________

Site Supervisor Signature: _____________________________ Date: ______________

FBCC Faculty Mentor: _____________________________ Date: ______________

*Assignment: Journaling and reflection on second informational interview with professional staff at the organization or partner organization; Final Evaluation given to site supervisor to be completed*
Name: __________________________

Fort Berthold Community College
Doka Hog Mahoo

Internship Activity Report

Week 11: August 9-13

<table>
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<th>Date/ Times</th>
<th>Activities Completed</th>
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</tbody>
</table>

Total Hours: ________________

Site Supervisor Signature: ___________________________ Date: __________

FBCC Faculty Mentor: ___________________________ Date: __________

*Assignment: Journaling and reflection on if and how the internship did or did not meet your expectations
### FBCC Science Department

**Internship Mid-Term EVALUATION**

Student Intern: ______________________________ Site: ____________________________________________

Site Supervisor: ___________________________ Phone: ________________________________________

**Directions to mentor:** Please complete this form. Type or write legibly. After reviewing with student, please make one copy for yourself and one for the student, and send the original to FBCC’s Science Department.

1. Please evaluate the student's demonstration of the following professional behaviors:

<table>
<thead>
<tr>
<th>BEHAVIOR</th>
<th>EXCEEDS EXPECTATIONS</th>
<th>MEETS EXPECTATIONS</th>
<th>NEEDS DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeps confidential information private (e.g., HIPAA laws)</td>
<td></td>
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</tr>
<tr>
<td>Professional demeanor (Verbal/non-verbal behaviors express values/attitudes appropriate for site)</td>
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<tr>
<td>Shows understanding of formal &amp; informal structure of your organization</td>
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<tr>
<td>Adheres to your organization’s dress code policy</td>
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<tr>
<td>Dependability</td>
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<tr>
<td>Attendance</td>
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<tr>
<td>Punctuality</td>
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<tr>
<td>Other (identify)</td>
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</tbody>
</table>

2. Please evaluate the student's demonstration of the following abilities:

<table>
<thead>
<tr>
<th>ABILITY</th>
<th>EXCEEDS EXPECTATIONS</th>
<th>MEETS EXPECTATIONS</th>
<th>NEEDS DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
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<tr>
<td>Initiative</td>
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<tr>
<td>Independent problem solving</td>
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<tr>
<td>Interaction with others (e.g., works well as a team member, handles tension &amp; conflict situations well, takes suggestions &amp; criticisms well)</td>
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<tr>
<td>Other (identify)</td>
<td></td>
<td></td>
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</tbody>
</table>

3. Work towards supervisor’s goals is progressing: YES                      NO

4. Work towards student’s goals is progressing: YES                      NO

5. Additional comments or concerns: (please use back)

**SIGNATURES:** Student: ____________________________ Mentor: ____________________________ Date: ______

Fort Berthold Community College  Environmental Science  Page 71 of 73
Student Intern: ______________________________ Site: ______________________________

Site Supervisor: ___________________________ Phone: ______________________________

Please type or write legibly.

1. How well did the student meet each of your work goals? Describe the quality of his/her work.

2. How well did the student show initiative in accomplishing assigned tasks? Please provide behavioral evidence.

3. How well do you think the student met his/her learning goals? Please provide behavioral evidence.

4. How well did the student take responsibility for his/her own learning? Please provide an example of how he/she demonstrated this.
Please evaluate the student's demonstration of the following professional behaviors:

<table>
<thead>
<tr>
<th>BEHAVIOR</th>
<th>EXCEEDS EXPECTATIONS</th>
<th>MEETS EXPECTATIONS</th>
<th>NEEDS DEVELOPMENT</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeps confidential information private (e.g., HIPAA Laws)</td>
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<tr>
<td>Professional demeanor (Verbal/non-verbal behaviors express values/attitudes appropriate for site)</td>
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<tr>
<td>Other (identify)</td>
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</table>

6. Please evaluate the student's demonstration of the following abilities:

<table>
<thead>
<tr>
<th>ABILITY</th>
<th>EXCEEDS EXPECTATIONS</th>
<th>MEETS EXPECTATIONS</th>
<th>NEEDS DEVELOPMENT</th>
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7. Overall, how would you evaluate the student's performance? Please check: _____ Satisfactory
Unsatisfactory

Additional comments:

SIGNATURES: Student: ___________________________ Mentor: ___________________________
Date: ___________________________

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