

APPENDIX

BUDGET

1. Personnel	STEM Coordinator	1.0 f.t.e. @ \$22,000 salary plus 25% fringe	25,000.00
	STEM Team 5 Members	5 @ \$2,898 each (September (1pp) and June (1pp) Salary & Fringe for 2PP	14,490.00
	STEM Department Head	@ 10% of Salary	4,360.00
	STEM Tutor/Mentors	100 hrs/wk x 30 weeks @ \$8.00/hr For 4 STEM majors	24,004.00
2. Travel	a. Travel to Senior Institutions:	2 trips to each Montana institution; \$1,000 for mileage lodging and peer diem.	5,700.00
	b. Travel to Reservation High Schools:	3 roundtrips to the 4 Reservation High Schools by Coordinator and 1 STEM Faculty Member. \$500 for mileage.	
	c. Mileage and Per Diem for Three Retreats:	Lodging and Per Diem for 5 STEM Faculty, STEM Department Head and STEM Coordinator x 2 days @ \$100/day x 7 STEM Personnel. \$4,200., 3 Retreats	
3. Equipment	Computer and monitor.		700.00
Maintenance			
4. Supplies	a. Office Supplies:	\$500 (office supplies, copier paper)	1,000.00
	b. Phone:	\$1,000 for phones, tolls & telecom tolls for AISTEC SR Colleges.	
	c. Postage	\$500	
	d. Copying	\$500	
5. Other	a. Evaluation	\$1,000 contract with external evaluator	2,000.00
	b. Accounting/Audit	\$1,000	
6. SMI	Instructors and assistants		25,000.00
	a. One teacher	c. Stipends	
	b. One Assistant	d. Lunches	
7. Total			102,254.00

CLOSE OUT REPORT ON FIRST PROJECT

Introduction

Little Big Horn College had a mission statement that determined a service area: the Crow Indian Reservation Community. Most generally, this has been defined as towns within the boundaries of the Crow Indian Reservation. In July 1999, a coalition of seven Billings, Montana-based organizations and agencies serving Crow Indian people requested an extended LBHC site for development and college classes in the city of Billings, Montana. The courses requested are from the LBHC catalog, and include developmental and general studies and information systems. A well-suited location for the site was identified.

The Little Big Horn College Board of Trustees voted to establish the Billings Site for classes in cooperation with the Native American Development Corporation (NADC), and was determined to be a critical service to the Crow Indian community of Billings. Therefore, the Substantive Change Request for the Little Big Horn College – Billings Site was approved.

ANTICIPATED PROJECT GOALS

The LBHC Billings Site will provide services to Crow and American Indian Students referred directly from eight Native American/Crow Indian agencies and human service organizations in Billings, Montana.

- Native American Development Corporation 50 students

- Billings Native American WIA Trainees 40 Welfare To Work
- Billings Crow Tribal Su-Office 20 students
- Plenty Coups High School, Pryor 5 students
- Montana State University and Veterans Upward Bound 15 students
- Billings Adult Learning Center 20 students

The LBHC Services Area

The Billings Site is outside the current LBHC service area boundaries a distance of nine miles north and 65 miles from Crow Agency. Little Big Horn College does offer classes in the Reservation town of Pryor, a distance of 85 miles from Crow Agency (north and west).

The Billings Site location is a suite of classrooms and technology labs within the Native American Development Corporation in downtown Billings, at 207 North Broadway. The site offers two fully equipped Microsoft Certified technology laboratories, three standard classrooms, central study lounges and Internet access. The organizations and agency partners all have convenient access to this location. All are within a ten-minute driving radius from the NADC, the Billings Site location.

PROJECT RESULTS

Although classrooms are available for the LBHC Billings Site and are rudimentary classrooms, equipped with tables, chairs, charts, dry-erase boards, standard

classroom lighting and heating, the project is slow because most of the target areas were unreachable. At the most, there are at least 5 students in each classroom. The students had access to library and information resources on-line through dial in access. The Dean of Student Services had weekly representatives available at the Billings Site for admissions, registration and advising. The LBHC Finance Office coordinated the student billing process. Books and materials appropriate for the six to eight classes offered were available. Tuition and fees were assessed at LBHC. The standard tuition is \$45/credit, plus 15 percent fee per credit.

Those students who registered and attended class received credit and or a certificate of completion. Their credits are transferable to any institution in Montana.

CONCLUSION

I was only coordinating in the absence of the original coordinator. On June 1, 2000 a new coordinator was hired for the position, and that was the end of my involvement with the Substantive Change Project. From then on the new coordinator administered the project. It was also convenient for her because she lived in Billings, Montana.

Lessons Learned

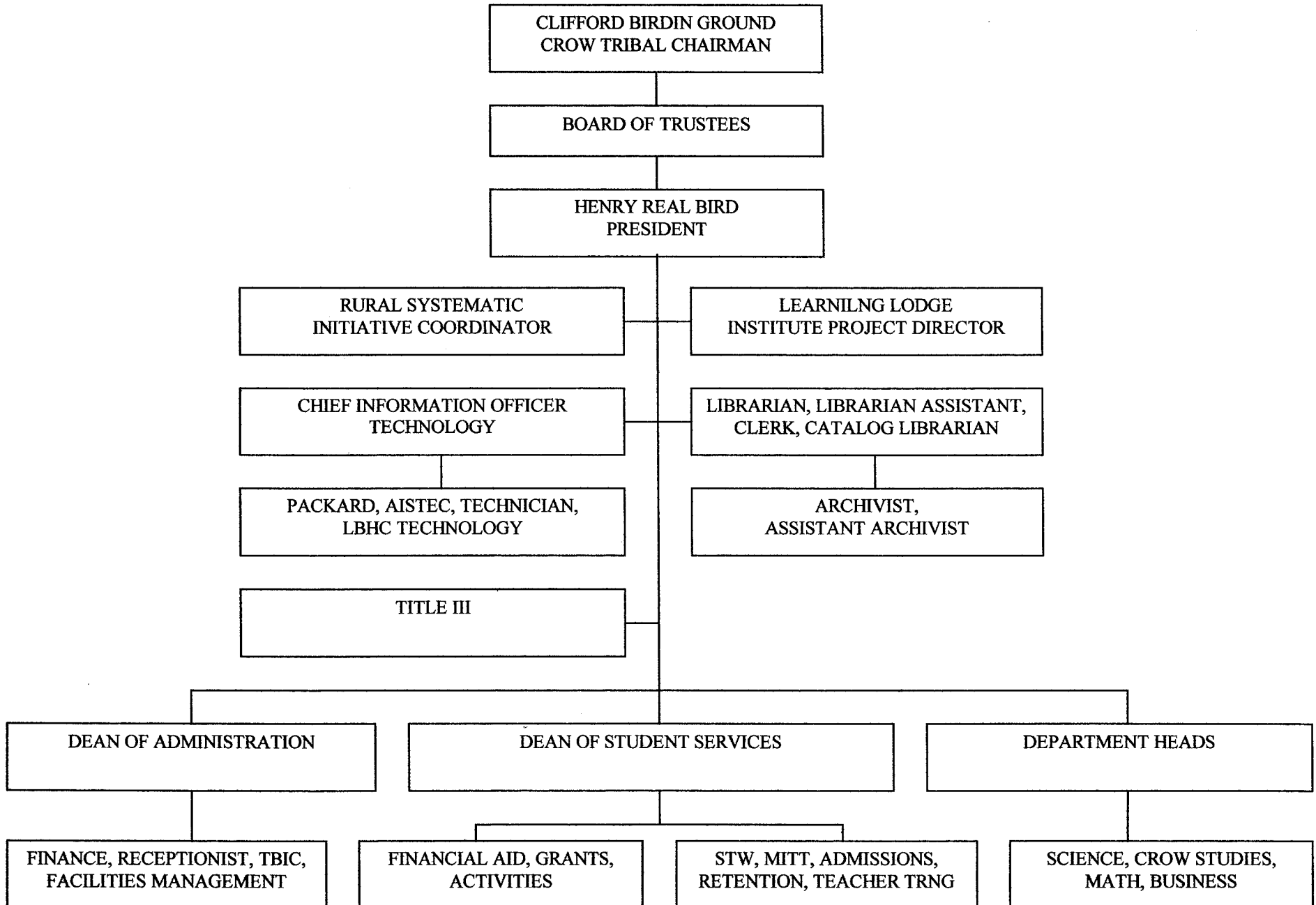
During my substituting in the Substantive Change Project for four months, I learned that there are groups of people out there that are comfortable just collecting welfare, child support, and living in section 8 housing. I was very appalled by the

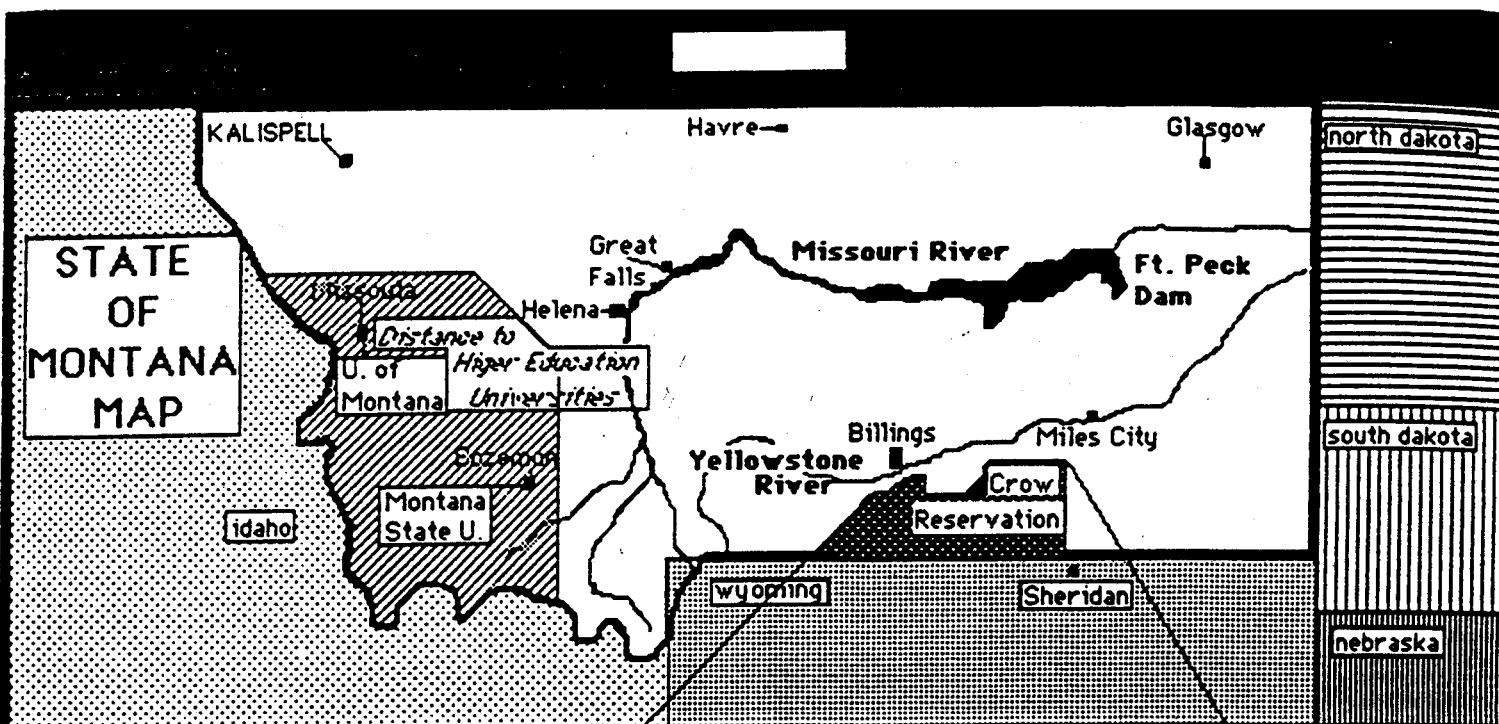
attitude of a society, hidden within the city limits that do not want to help themselves or improve their lifestyle.

Although I visited all the aforementioned agencies and organizations, recruiting for the NADC Billings Site was very difficult. Therefore, NADC had very few participants than that which was anticipated.

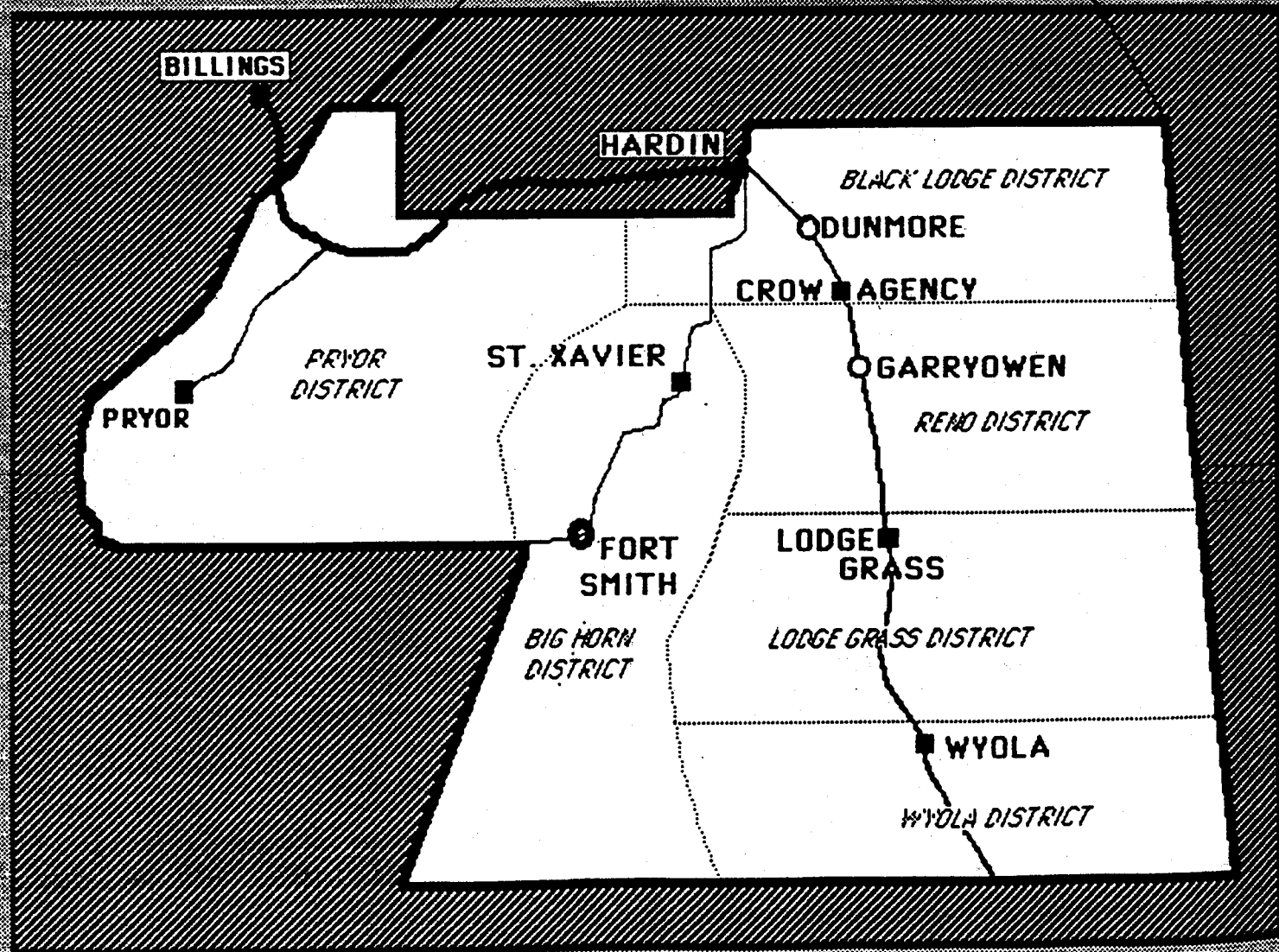
Other factors that hinder and discourage the NADC Billings Site are the colleges in Billings area. Billings has a population of about 200,000 so having one college, one university, Business College, Vo-tech school, Bible College, adult learning center, and many other technical training centers are the main factors for having few participants at NADC Billings Site. The other reason for not meeting the anticipated participants was the fact that NADC could not register non-Indians. Recruiting other than the non-Indian population was disallowed. A rule made by someone other than me.

LITTLE BIG HORN COLLEGE ORGANIZATIONAL CHART





MAP OF THE CROW RESERVATION
IN SOUTHEASTERN MONTANA





Students





Students

STEM Science, Technology, Engineering and Math Packet
2000-2001

CROW INDIAN STEM PROJECT

Funded by the American Indian Science and Technology Education
Consortium

Prepared for Hardin High School

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STEM Science, Technology, Engineering, and Math Packet

2000-2001

CROW INDIAN STEM PROJECT

Funded by the American Indian Science and Technology Education Consortium

Purpose

The purpose of the Crow Indian STEM (Science, Technology, Engineering, and Math) Project is to aid students in preparing for a career in science, technology, engineering, or math. This system utilizes “two plus two plus two” agreements between Crow Reservation high schools, Little Big Horn College, and the four-year universities in Montana. These agreements have been designed to help prepare high school students for college through careful selection of coursework for science and technology based careers.

Consultants from Little Big Horn College have examined course descriptions and objectives offered by your high school and have derived suggested plans of study for students interested in science, technology, engineering, or math to be taken during the students’ junior and senior years (the first “two”). The goal is to help students make the transition from high school to Little Big Horn College in the disciplines of math and science; that is to bring down the boundaries between high school and college level math and science.

The next portion of the agreement (the second “two”) is between the faculty of Little Big Horn College and the students. Upon matriculation into LBHC, the students will follow a suggested plan of study developed as appropriate, relevant, and transferable to a four-year institution that offers a career based four-year degree. This gives the students’ the advantage of attending a college within their community while preparing them for transfer to a four-year institution.

The final “two” in this agreement is between Little Big Horn College and the Montana University System. After leaving Little Big Horn College with an associates degree, your students will spend two years at a four-year university completing their degree. The consultants from LBHC have ensured that all suggested courses are transferable from LBHC to the Montana University System.

As an example, suppose a student tells his or her high school instructor or counselor that he or she has an interest in medicine. The instructor or counselor will consult the STEM packet designed for that high school, and note that a suggested plan of study includes: mathematics through trigonometry and pre-calculus, two years of biology, one year of chemistry, one year of physics, advanced composition, and information systems. The student can then choose those courses during registration. If the student has taken the suggested courses during junior and senior years, he or she should have a smoother transition into LBHC and a greater chance of succeeding the community health curriculum. The following two years at LBHC will be spent studying chemistry, biology, calculus, research writing, physics, and anatomy and physiology. This time will be used to hone the student's academic skills and prepare the student for transfer to MSU-Billings, MSU-Bozeman, Rocky Mountain College, or the University of Montana. Once the student has transferred from LBHC to one of these institutions, he or she will finish their four-year degree during the final two years of STEM and apply to medical school during their junior year of college.

In summary, the STEM project has been designed with a "two plus two plus two" agreement. The first two years were designed to prepare students for college. The second two years are spent at LBHC earning credit towards a four-year degree. The final two years are spent at one of the four-year universities in Montana.

Purpose of STEM

1. To help students prepare for college as soon as their junior year of high school.
2. To create a seamless transition from high school math and science to college level math and science.
3. To develop a career based plan of study to guide students from high school through completion of bachelor's degrees.
4. To train Crow students in science, technology, and math based careers, giving the students ownership of that knowledge, leading to increased opportunity on and off the Crow Indian Reservation.

Why STEM is Necessary

1. Technology, engineering, and science are all math based.
2. 40% of all career opportunities are math or science based.
3. Students spend an average of 3.7 years at Little Big Horn College pursuing a two-year degree.
4. One quarter to one third of all courses at Little Big Horn College are taught on a developmental level.
5. We want to set students on their way towards a career so they do not waste their precious time and financial aid on excess years at LBHC.

Why We Need Your Help

1. 65% of all Crow high school students from Lodge Grass, Plenty Coups, St. Labre, and Hardin attend Little Big Horn College after high school.
2. College level courses are at least a year away from almost all LBHC entering freshmen.
3. Students choose their high school courses based on lack of information, ease, or to “float” to graduation.
4. We want to influence students into taking gateway courses that will open opportunity to our Crow students.

Working with you, we have developed a suggested plan of study that informs students which courses they should take in preparation for matriculation at Little Big Horn College with a specific career in mind. This plan of study consists of a packet that has been custom designed for your high school and specific career goals. The individual packets have been arranged according to Science, Technology, Engineering, or Math. This enables students to enter LBHC better prepared for a specific career or field. At LBHC we will prepare the students for a four-year university while teaching the freshman and sophomore curricula. The final phase is completion of a STEM based four-year degree.

Contacts

Below is a list of contacts at Little Big Horn College. Please feel free to call or email us regarding any questions.

Collena Caplett , STEM coordinator	638-3181	<u>caplett@looksmart.com</u>
Willis Tsosie , Technology consultant	638-3133	<u>wtosie@main.lbhc.cc.mt.us</u>
Maxine Hamburg , Technology consultant	638-3130	<u>maxine@main.lbhc.cc.mt.us</u>
Jana Brockie , Math consultant	665-1908	<u>jfh2os@yahoo.com</u>
Kris Cunningham , Science and Engineering consultant	638-3136	<u>kris@main.lbhc.cc.mt.us</u>

Programs of Study for Science

On the following pages are the individual programs of study for science offered at Little Big Horn College. Each section starts with a series of options that students may choose from at each Montana university. A course outline of the appropriate program of study is listed in the next section. This is followed by a suggested plan of study for preparing high school students for matriculation into LBHC.

Which Program Do I Choose?

Listed below are the individual programs of study offered at Little Big Horn College that have been cross referenced to several four year degrees. If the student's science career of choice is not listed below, feel free to contact the consultant to discuss a proper plan of study.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts	Nursing	MSU-Bozeman
Pre-nursing option	Pre-Physical Therapy*	MSU-Billings MSU-Bozeman Rocky
	Pre-Medicine and Pre-Medical Science*°	MSU-Billings MSU-Bozeman Rocky U of Montana
	Pharmacy*	U of Montana
	Physical Therapy*°	U of Montana

*Denotes that the SC 131/135 & SC 132/136 Advanced Chemistry I & II should be taken instead of SC 121/125 & SC 122/126 Intro to Gen Chem & Intro to Biochem.

°It is suggested that students interested in these classes also complete MA 181 & MA 182 Calculus I & II prior to matriculation into a four year college.

LBHC Program of Study

Associate of Arts
Community Health

Four Year Degree

Community Health*

Offered At

MSU-Bozeman

Dietetics*

MSU-Bozeman

Health Enhancement*
Teaching

MSU-Bozeman

Human Services

MSU-Billings

Rehabilitation and
Related Services

MSU-Billings

*Denotes SC 121/125 & SC 122/126 Intro to Gen Chem & Intro Biochem are required for degree

LBHC Program of Study

Associate of Arts
Natural Resources/
Environmental Science

Four Year Degree

Fish and Wildlife
Management

Offered At

MSU-Bozeman
U of Montana

Environmental*
Health/Science

MSU-Bozeman
Rocky
U of Montana

Microbiology*

MSU-Bozeman

Forestry

U of Montana

Resource Conservation

U of Montana

*Denotes that SC 131/135 & SC 132/136 Advanced General Chemistry I & II are required for these degrees.

LBHC Program of Study

Associate of Arts
General Science

Four Year Degree

Biology*°

Offered At

MSU-Billings
MSU-Bozeman
Rocky
U of Montana

Chemistry*°

MSU-Billings
MSU-Bozeman
Rocky
U of Montana

Geohydrology*°

MSU-Bozeman

LBHC Program of Study

Associate of Arts
General Science

Four Year Degree

Geology*°

Offered At

Rocky
U of Montana

*Denotes that SC 131/135 & SC 132/136 Advanced General Chemistry I & II are required for these degrees.

°Denotes that MA 182 Calculus II is required for these degrees.

Little Big Horn College Programs Of Study - Science

ASSOCIATE OF ARTS IN SCIENCE: PRE-NURSING OPTION

This program of study is for those students who are pursuing a degree as a Registered Nurse and wish to earn an Associate of Arts Degree prior to receiving a two-year or four-year degree at another institution. Fulfilling LBHC requirements will allow a student to acquire many of the courses offered in two-year RN programs, or prepare for transfer to a four-year institution at the junior level.

To earn a degree in Science: Pre Nursing Option, a student must complete the core Requirements as well as the courses listed below:

Program of Study

PY 201	Lifespan Development	3
SC 212/213	Microbiology and Disease/Lab	4
SC 210	Anatomy and Physiology/Lab	4
SC 211	Anatomy and physiology/Lab	4
SC 214	Nutrition	3
SC 122/126	Intro to Biochemistry/Lab	4
SS 101	Sociology	3
Total Program Credits		25

35 Credits CORE + Program of Study 25 = 60 Credits

TWO YEAR PLAN OF STUDY: PRE-NURSING OPTION**Fall Year 1**

SC 121/125	Intro to Gen Chem	4
SC 110	Principles of Bio/Lab	4
CORE Requirements		9

Fall Year 2

SC 210	Anatomy & Phys.	4
CORE Requirements		9

Spring Year 1

SC 122/126	Intro to BioChem/Lab	4
PY 201	Lifespan Develop	3
CORE Requirements		9

Spring Year 2

SC 211	Anatomy & Phys.	4
SC 212/213	Micro & Disease	4
SS 101	Sociology	3
SC 214	Nutrition	3

ASSOCIATE OF ARTS DEGREE IN SCIENCE: COMMUNITY HEALTH

This program of study is concerned with improving health and well-being for the promotion of healthful lifestyles, community actions for health, and conditions that make it possible to live healthy lives. Students can transfer to a four-year institution to complete this degree that will prepare them for entry level employment related to community health.

Program of Study

HE 201	Wellness	3
HS 111	Chemical Dependency	3
SC 210	Anatomy and Physiology I	4
SC 211	Anatomy and Physiology II	4
SC 212/213	Microbiology & Disease/Lab	4
SC 214	Nutrition	3
SC 244/245	Environmental Science/Lab	4

Total Program Credits 25

35 Credits CORE + 25 Program of Study = 60 credits

TWO YEAR PLAN OF STUDY: COMMUNITY HEALTH

Fall	Year 1		Spring	Year 1	
HS 111	Chemical Dependency	3	HE 201	Wellness	3
Core Requirements		11	SC 244/245	Environ.Sci	4
			Core Requirements		9
Fall	Year 2		Spring	Year 2	
SC 210	Anatomy & Phys. I	4	SC 211	Anatomy & Phys. II	4
CORE Requirements		9	SC 212/213	Micro/Lab	4
			SC 214	Nutrition	3
			CORE Requirements		6

ASSOCIATE OF ARTS DEGREE IN : NATURAL RESOURCES/ENVIRONMENTAL SCIENCE

Natural Resource Management is a broad field where professionals work to preserve, conserve and manage natural resources. Careers may be in fish & wildlife, forestry, range management, agriculture, national parks, or many other areas. Environmental science careers focus on environmental protection and rehabilitation from harmful human impacts, such as overgrazing, mining and pollution. Careers may be in environmental science, land or water resources, reclamation, or many other areas.

Program of Study

SC 102 Ecology+Lab	4
SC 112 Biodiversity	4
One of the following:	
SC 122 Intro to Biochemistry	4
SC 132 Adv.Gen Chem II	4
SC 244 Environmental Science+Lab	4
MA 216 Elementary Statistics	3
Additional credits (as listed here)	7-8

Natural Resource majors take two

SC 203 Rangeland Resources/Lab	4
SC 202 Identification Seed Plants	4
SC 205 Soils	4
IS 260 GIS/GPS	3
SC 276 Internship	4

Environmental Science majors take two

SC 104 Geology + Lab	4
SC 202 Identification of Seed Plants	4
SC 205 Soils	4
IS 260 GIS/GPS	3
SC 276 Internship	4

Total Credits: 26-27

Also recommended: IS104/105 Intro to Computers, BU220 Economic Way of Thinking
35 core Requirements + 26-27 Program of Study = 61-62

TWO YEAR PLAN OF STUDY: NATURAL RESOURCES/ENVIR. SCIENCE

* Denotes Core classes that MUST be taken for this major.

Students pursuing natural resources careers usually take the SC121 chemistry sequence; those interested in environmental science careers take the SC131 chemistry sequence. Freshmen should complete writing and information systems requirements in year one.

Fall Year 1

*SC 110 Principles of Biology + Lab	4
Core requirements	12

Fall Year 2

*SC121 or SC131	4
SC 102 Ecology	4
Science elective	3-4
Core requirement	3

Spring Year 1

SC 112 Biodiversity + Lab	4
*MA 165 Pre Calculus	4
Science elective	3-4
Core requirements	6

Spring Year 2

SC 244 Environmental Sci.	4
SC 122 or 132 Chemistry	4
MA 216 Statistics	3
Core requirement	3

ASSOCIATE OF ARTS IN SCIENCE: GENERAL SCIENCE OPTION

The General Science Option is designed for the student planning transfer to a four-year college in science. This option provides a solid background in a variety of science fields including pre-professional health careers and secondary science education. The student will be assigned an advisor from the science faculty depending on the student's area of interest.

Program of Study

*MA 181	Calculus I	4
MA 216	Elem Statistics	3
**SC 121/125	Intro to Gen Chem/Lab	4
SC 122/126	Intro to Biochemistry/Lab	4
Or		
**SC 131/135	Adv. Gen. Chemistry/Lab I	4
SC 132/136	Adv. Gen Chemistry/Lab II	4

Choose four (4) of the following courses for 12-14 credits

SC 102/103	Ecology/Lab	4
SC 110/111	Principles of Biology/Lab	4
SC 112/113	Biodiversity/Lab	4
SC 210	Anatomy & Physiology I	5
SC 211	Anatomy & Physiology II	5
SC 213/213	Micro & Disease/Lab	4
SC 244/245	Environmental Science/Lab	4

*Fulfills group requirement for math

**Fulfills group requirement for science

35 CORE Credits + 23-25 Program of Study Credits = 58-60

TWO YEAR PLAN OF STUDY: GENERAL SCIENCE OPTION

Fall Year 1			Spring Year 1		
SC	Chemistry Sequence	4	SC	Chemistry Sequence	4
MA 181	Calculus I	4	MA 216	Elem. Statistics	3
Core Requirements		9	Core Requirements		9
Fall Year 2			Spring Year 2		
SC	Science Elective	4	SC	Science Elective	4
SC	Science Elective	4	SC	Science Elective	4
Core Requirements		6	Core Requirements		3

Hardin High School Suggested Plan Of Study

The following courses are suggested for a smooth transition from Hardin High School into the Little Big Horn College science curriculum. The classes that apply for all science options at LBHC are listed below. Other classes that will aid students are listed under each option's heading.

For all Associates of Arts in Science Options:

Junior Year

English 11 or English 11H
Math Varies, see below
Chemistry

Senior Year

English 12 or English 12AP
Math Varies, see below
Advanced Biology

For Pre-Nursing Option:

Physics is suggested for students interested in a pre-physical therapy, pre-medicine, and pre-medicinal science. Students should follow the **Algebra I through Calculus** math sequence if interested in nursing or pre-physical therapy, and either **IM1-2-4-6** or **Advanced 2-4-6-calculus** for pre-medicinal science or pre-medicine. **Physical education/health education** is also suggested for these students.

For Community Health Option:

Global Studies and **child development** are suggested as well as **physical education/health education**. Math courses should follow the **IM1-2-4-6** curriculum.

For Natural Resources/Environmental Science Option:

Global studies is recommended for students interested in any degree related to this option. If time allows, suggest that students also take **agriculture education**. Math courses should follow the **IM1-2-4-6** curriculum.

For General Science Option:

Physics is strongly suggested as well as the criteria from above. Math courses should follow **IM1-2-4-6** or **Advanced 2-4-6-calculus** curricula.

Little Big Horn College Science Course Descriptions

SC 050 Survival Chemistry

1 cr F

Basic fundamentals of chemistry as it applies to biology. Recommended for students with no previous chemistry, or who would like a brief review of chemistry, and who are taking or will be taking SC111, SC112, SC113, SC 242 or SC244. Open to any student. There are fifteen class periods for the first four weeks of the quarter.

SC 101 Mysteries of the Sky

3 cr F/S*

A non-mathematical survey of the Universe, from our planet Earth, our neighboring planets and the sun, outward to the constellations, our galaxy and the Universe beyond.

Includes sun spots, comets, black holes, quasars and cosmology. Recent discoveries will be presented. Students will learn how to handle a telescope and one mandatory night laboratory is included.

SC 102 Ecology

3 cr F (2001)

Students will develop an understanding of how the natural world works by studying the relationships among plants, animals and other living things and between living things and their environments. The course will explore how species evolve, and the composition, function and distribution of populations, communities and ecosystems. It is recommended that students without a high school chemistry background enroll in SC 050 Survival Chemistry prior to enrolling in SC 102.

SC 103 Ecology Lab

1 cr F (2001)

Ecology Lab accompanying SC 102 Ecology.

SC 104 Introduction to Geology

3 cr S

This course covers minerals, rocks, geologic time, heat, volcanism, earthquakes, magnetism, gravity and mountain building processes as related to plate tectonics and land forms. Weathering, glaciers, rivers, oceans and beaches are introduced.

SC 105 Introduction To Geology Lab

1 cr S

Laboratory to accompany SC 104. Includes field trips.

SC 110 Principles of Biology

3 cr F

This course addresses biological principles common to living things. The course content includes cell structure, function, metabolism and reproduction. Energy pathways, basic genetics, evolution, classification, diversity and ecology are included in the course. The lab is a required co-requisite. Student who do not have a chemistry background are strongly advised to enroll in SC 050 Survival Chemistry.

SC 111 Principles of Biology Lab

1 cr F

Laboratory to accompany SC 110. Includes laboratory experiments related to course work in SC 110 Principles of Biology.

SC 112 Biodiversity

3 cr S

Biodiversity is an overview of the diversity of life, examining bacteria, protists, fungi, plants and animals, with an emphasis on animals and vascular plants. Classification, survival strategies, reproduction ecological importance and comparison of biological systems are a part of the course content. The lab is a required co-requisite.

SC 113 Biodiversity Lab

1 cr S

The Biodiversity lab includes laboratory experiments related to course work in SC 112 Biodiversity.

SC 116 Physical World Around Us**3 cr F/S**

This course is intended for education majors and non science majors. This course introduces students to the fundamentals of chemistry, physics, and earth science and their roles in our understanding of the world. This course explores the impacts of each on our society.

SC 117 Physical World Lab**1 cr F/S***

Lab that corresponds with SC 116

SC 121 Introduction to General Chemistry**3 cr F (2000)**

This is an introductory chemistry course designed for pre-nursing students and students lacking a strong background in chemistry. This course will cover general chemistry including: atomic structure, periodicity, chemical bonding, chemical reactions, acid-base systems, thermodynamics, and the behavior of gasses, liquids, solids, and solutions. This course will also cover selected topics in organic chemistry including: nomenclature, functional groups, organic synthesis, and the structure and role of organic molecules.

SC 122 Introduction to Biochemistry**3 cr S (2001)**

This course is the second half of the introductory chemistry for pre-nursing students and non-science majors. This course will cover functional groups of organic molecules and discuss their role in the synthesis of biomolecules. Other topics included are: the role of biological molecules such as carbohydrates, lipids, proteins, nucleic acids, and metabolic processes and cellular structure.

SC 125 Introduction to General Chemistry Lab**1 cr F (2000)**

Lab that corresponds with SC 121

SC 126 Biochemistry Lab**1 cr S (2001)**

Lab that corresponds with SC 122

SC 131 Advanced General Chemistry I**3 cr F (2001)**

This course introduces students to the fundamental concepts of chemistry. This includes atomic structure, stoichiometry, chemical bonding, and laws governing the relationships of elements and compounds.

SC 132 Advanced General Chemistry II**3 cr S (2002)**

This course is a continuation of SC 131. It covers solubility, equilibria, entropy, free energy, electrochemistry and inorganic descriptive chemistry.

SC 135 Advanced General Chemistry I Lab**1 cr F (2001)**

Lab that corresponds with SC 131

SC 136 Advanced General Chemistry II Lab**1 cr S (2002)**

Lab that corresponds with SC 132

SC 202 Seed Plants**3 cr F (2002)**

The course will introduce the student to tress, shrubs and herbaceous flowering plants in the local area. The student will collect and prepare plant specimens. Vocabulary, classification, nomenclature and the use of manuals (plant “keys”) will be a part of the course material. Half of course time will be devoted to lab and field exercises.

SC 203 Range Land Resources**3 cr F (2002)**

This course describes the world’s range lands as related to their historic, present and potential use. The course will include Plains grasslands. Special attention will be given to how range land uses affect the nutrient, biological and hydrological cycles around the world and how the ecosystems respond to change. Concepts related to ecological conditions, land potential and ecological trends are introduced in the course material.

SC 204 Range Land Resources Lab**1 cr F (2002)**

Lab accompanying SC 203 Range Land Resources

SC 205 Soils**3 cr S**

The Soils course acquaints the student with soil properties the components of ecosystems and landscapes. How knowledge of soils is applied to the management of agricultural, wildland and urban landscapes is a major part of the course work. The student will be made aware of the problems related to environmental science.

SC 210 Anatomy & Physiology I**4 cr F**

This course is the first in the A&P sequence. SC 110, Principles of Biology is a prerequisite. In this course the student will examine cellular structure, the integumentary system, the muscular system, the skeletal system, and nervous system, and the endocrine system if time allows. Lecture is three times per week focusing on physiology. One period per week is reserved for discussions related to anatomy. Field trips and lab experience incorporated into coursework.

SC 211 Anatomy & Physiology II**4 cr S**

This course is a continuation of SC 210. In this course the student will examine the endocrine, blood and lymph, cardiovascular, respiratory, urinary, digestive and reproductive systems. Lecture is three times per week focusing on physiology. One period per week is reserved for discussions related to anatomy. Field trips and lab experience incorporated into coursework.

SC 212 Microbes & Disease**3 cr S**

The prerequisite for this course is SC 110 Principles of Biology, as knowledge of cells is essential to the study of microbes. The course begins with a general history of microbiology and microscopes. An overview of the anatomy and physiology of bacteria, viruses, protozoan, and fungi is part of the course content. The remainder of the course is devoted to studying organ/organ system diseases, and the type of microbes that cause

them. Also included are concepts of immunity, and general laboratory procedures. Upon completing the course, the student should have a general knowledge of disease causing antigens, and how these organisms are handled in a lab setting.

SC 213 Microbes & Disease Lab

1 cr S

Lab accompanying SC 212

SC 214 Nutrition

3 cr S (2002)

This course covers the basic concepts of human nutrition as related to health and food consumption at the different stages of the life cycle. In addition, nutritional assessment and dietary modifications used in health and disease are also studied.

Prerequisites: SC110; SC 121 or 131

SC 244 Environmental Science

3 cr S

Environmental Science acquaints the student with the relationship between people and the environment and how human activities affect the earth's natural ecosystems. The course addresses environmental issues such as range and farmland practices, soil ecology, pests and pesticides and alternative methods of pest control, the water cycle and water pollution, air quality and air pollution, hazardous and solid waste management. The student will learn ways to reduce and prevent pollution, population management, protection of wild species, and how to sustain the earth's natural ecosystem upon which life depends.

SC 245 Environmental Science Lab

1 cr S

Laboratory experience accompanying Environmental Science

SC 276 Science Internship

OD

Provides student with the opportunity to apply theoretical knowledge in a work placement experience. Academic Advisor will assist student with work place placement and development of course objectives. Registration in this course is restricted.

Social Science

SS 101 Introduction to Sociology

3 cr S

This course is a survey of Sociology and designed to cover the study of society, organizations, social interactions, socialization, institutions, deviance and social control stratification, ethnic and racial minorities, gender and the family, education, religion and other topics from a sociological perspective.

Little Big Horn College Core Requirements

The following information is of general interest to the student. You should consult a four-year university catalog as well as contacting the STEM consultant to ensure that classes are chosen wisely when preparing your students for the adventure ahead. Listed on the next page are the core requirements; these should be chosen wisely to eliminate excess semesters when the students are ready to matriculate into Little Big Horn College.

CORE REQUIREMENTS

All students must fulfill the CORE REQUIREMENTS as a foundation to their programs of study. In order to graduate from LBHC, students will need to complete **35 credits in the following categories**. Advisors will assist the student with selection of Core Requirements. Courses may not be substituted for Core Requirements courses.

Category I: Communication Arts	Credits	Fall	Spring
*9 Credits must be completed in this category			
CA 101 Composition I	3	X	X
CA 102 Advanced Writing	3		X
CA 203 Research Writing	3	X	
CA 112-Public Speaking	3	X	X
Category 2: Crow Studies			
*6 Credits must be completed in this category			
CS 101 Crow Language I (Required)	3	X	X
CS 122 Crow Social Familial	3		X
CS 211 Thought and Philosophy	3	X	
Category 3: Science (must include one lab course)			
*7 to 8 Credits must be completed in this category			
One Life Science:			
SC 110 Principles of Biology /Lab	3+1	X	
SC 112 Biodiversity/Lab	3+1		X
One Physical Science:			
SC 121 Fundamentals of Gen Chemistry/Lab	3+1	X	
SC 101 Mysteries of the Sky	3	X	X
SC 116 Physical World Around Us / Lab	3+1	X	
Category 4: Mathematics			
* 4 Credits must be completed in this category			
MA 150 Finite Math	4	X	X
MA 165 Pre Calculus	4	X	X
Category 5: Information Systems			
*3 Credits must be completed in this category			
IS 101-103 Introduction to Computers	3	X	X
Category 6: Humanities			
*3 Credits must be completed in this category			
CA 106 Intro to Literature	3		X
CS 108 Literature of the American Indian	3	X	
HU 101 Survey of Humanities	3		X
Category 7: Social Sciences			
*3 Credits must be completed in this category			
PY 101 General Psychology	3	X	X
SS 101 Introduction to Sociology	3		X
AN 111 Cultural Anthropology	3		X

TOTAL CORE REQUIREMENTS: 35 CREDITS

Student STEM Worksheet For Hardin High School

Pre-Nursing & Medical Sciences

Pursuing a career in the medical field is a very admirable notion. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to become a nurse, a doctor, a veterinarian, an optometrist, a pharmacist, a dentist, a physical therapist, or pursue any other career in medicine it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Advanced Biology will supplement the information you picked up in Biology and reinforce the concepts learned there as well as introduce human anatomy and physiology. Many of the illnesses that you will treat require that you have a working knowledge of bacteria, viruses, and animals. The chemistry, which requires much effort and work, is very important. There is an enormous amount of chemistry that goes along with medicine. Just think of all the different medicines that we have! How those medicines affect an organism is based solely on their chemical properties. So why should there be so much math? Each one of the career choices from above requires careful observation, deduction skills, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. After all, physics is nothing more than applied math. Each of these courses should give you an advantage as you start acquiring the skills necessary for pursuing one of these exciting careers. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
Advanced Biology	___	___	___	___
Algebra II*	___	___	___	___
Pre-calculus*	___	___	___	___
Calculus*	___	___	___	___
Biology	___	___	___	___
Chemistry	___	___	___	___
Physics	___	___	___	___
Phys Ed/Health Ed	___	___	___	___
IM 4●	___	___	___	___
IM 6●	___	___	___	___
Adv IM 4°	___	___	___	___
Adv IM 6°	___	___	___	___

*These courses are for pre-nursing or pre-physical therapy students.

°These courses are for pre-medicine or pre-medicinal science students.

●These courses can be substituted for pre-medicine or pre-medicinal science.

**Student Stem Worksheet for Pre-Nursing and
Pre Medicinal Science Options
Pre-Nursing Option**

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	ENG 9	ENG 10	ENG 11	ENG 12
Math	Algebra 1	Geometry	Algebra 2	Precalculus/ Calculus
Science	Earth Science	Chemistry	Biology	Advanced Biology

Pre-Medicinal Science Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	ENG 9	ENG 10	ENG 11	ENG 12
Math	IM1	IM2	IM4	IM6
Science	Earth Science	Chemistry	Biology	Advanced Biology
Electives				Physics

It is suggested that students achieve this minimal level in math and science.

Taking advanced and honors courses will greatly benefit you as you get ready to transfer into LBHC.

Notes:

Student STEM Worksheet For Hardin High School

Community Health

Pursuing a career in community health shows that you are concerned about the wellness of those in your community. With this type of degree you can teach those around you how to keep a healthy attitude, keep in shape, eat right, counsel, and rehabilitate. It is a very honorable career choice. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. In order to understand why some lifestyles are healthier than others it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Advanced Biology will supplement the information you picked up in Biology, reinforce the concepts learned there, and introduce human anatomy and physiology. The chemistry, which requires much effort and work, is very important. Chemistry will help you understand how a bad water supply, unclean air, a high fat diet, and numerous other circumstances can affect your community. These science courses will show how many of the illnesses that arise from a poor diet, an injury, unclean working conditions, or unplanned events can be prevented or treated by improving the quality of life and the resources that we use. So why should there be so much math? Each one of the career choices from above requires careful observation, deduction skills, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. Child development and physical education will supplement your knowledge base with information vital for community health. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
IM 4	___	___	___	___
IM 6	___	___	___	___
Advanced Biology	___	___	___	___
Chemistry	___	___	___	___
Child Development	___	___	___	___
Phys Ed/Health Ed	___	___	___	___
Global Studies	___	___	___	___

Community Health Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	ENG 9	ENG 10	ENG 11	ENG 12
Math	IM 1	IM 2	IM 4	IM 6
Science	Earth Science	Chemistry	Biology	Advanced Biology
Electives			Health Ed	Phys Ed
Electives			Child Development	Global Studies

It is suggested that students achieve this minimal level in math and science.

Taking advanced and honors courses will greatly benefit you as you get ready to transfer into LBHC.

Notes:

Student STEM Worksheet For Hardin High School

Natural Resources and Environmental Science

If you care about depleting or ruining the food and fuel we need, you may be interested in pursuing a career in Natural Resources and Environmental Science. Related fields include fish and wildlife management, environmental and health sciences, forestry, and resource conservation. In any of these careers you will be a scientist who checks and experiments on our natural resources. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to pursue any of these careers it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Advanced Biology will supplement the information you picked up in Biology I and reinforce the concepts learned there. The chemistry, which requires much effort and work, is very important. There is an enormous amount of chemistry that goes along with managing our resources. The pH of soil and water are great indicators of how healthy streams, forests, and fields are. Chemistry also plays a role in recycling, burning of fossil fuels, and mining of minerals. So why should there be so much math? Because every one of these careers will make you a scientist. Scientists require the ability to perform careful observation, utilize deduction skills, and most of all, the ability to calculate. You can think of managing resources as a math problem based on supply and demand. The importance is that the math skills you will acquire will aid you immensely as you pursue your college degree. The agriculture education classes are intended to give you a real working knowledge of how natural resources are used. This applies to raising cattle on grass or erosion of topsoil in a wheat field. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
IM 4	—	—	—	—
IM 6	—	—	—	—
Advanced Biology	—	—	—	—
Chemistry	—	—	—	—
Ag Ed 1,2,3	—	—	—	—

Natural Resources/Environmental Science Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	ENG 9	ENG 10	ENG 11	ENG 12
Math	IM 1	IM 2	IM 4	IM 6
Science	Earth Science	Chemistry	Biology	Advance Biology
Electives	Ag Ed 1	Ag Ed 2	Ag Ed 3	Global Studies

It is suggested that students achieve this minimal level in math and science.

Taking advanced and honors courses will greatly benefit you as you get ready to transfer into LBHC.

Notes:

Student STEM Worksheet For Hardin High School

General Sciences

Those with a sharp analytical mind tend to lean towards the general sciences. You can be a biologist, a chemist, a geohydrologist, a geologist, or a microbiologist. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to pursue any career in science it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Advanced Biology will supplement the information you picked up in Biology and introduce human anatomy and physiology. The chemistry, which requires much effort and work, is very important. There is an enormous amount of chemistry that goes along with every science. So why should there be so much math? Biology is derived from chemistry and chemistry is derived from physics. Physics is applied math, therefore the math is essential. As a scientist you will be required to utilize and develop the skills of careful observation, deduction, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. The math will also help you understand the study of physics. Each of these courses will aid you as you begin to acquire the skills necessary for pursuing one of these careers. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
IM 4	___	___	___	___
IM 6	___	___	___	___
Adv IM 4*	___	___	___	___
Adv IM 6*	___	___	___	___
Advanced Biology	___	___	___	___
Chemistry	___	___	___	___
Physics	___	___	___	___

*Advanced IM courses can be substituted for IM courses.

General Science Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	ENG 9	ENG 10	ENG 11	ENG 12
Math	IM 1	IM 2	IM 4	IM 6
Science	Earth Science	Chemistry	Biology	Advance Biology
Electives				Physics

It is suggested that students achieve this minimal level in math and science.

Taking advanced and honors courses will greatly benefit you as you get ready to transfer into LBHC.

Notes:

Programs of Study Technology Packet

Little Big Horn College

Associate of Arts in Computer Science

PROGRAM OF STUDY

IS 104	Spreadsheet	1	
IS 105	Database	1	
IS 220	Database Management	3	
IS 221	Numerical Analysis/Spreadsheets	3	
IS 250	Structured Business Programming	3	
IS 211	HTML and Web Page Design	3	
BU 221	Principles of Accounting I	3	
CP 254	Programming I	3	
CP 255	Programming II	3	
CP 256	Advanced Programming – Java, Oracle	3	
CP 257	Visual Basic Programming	3	
MA181	Calculus I	4	
	IS Course Option:	3	TOTAL CREDITS 33
	<i>IS 210 Desktop Publishing, IS 241 Computer Network Fundamentals</i>		
	<i>IS 240 Tech Troubleshooting, IS 260 Geographic Information Systems</i>		

CORE REQUIREMENTS

Communications - (9 credits must be completed)

CA 101	Composition I	3
CA 102	Advanced Writing	3
CA 203	Research Writing	3
CA 112	Public Speaking	3

Crow Studies - (6 credits must be completed)

CS 101	Crow Language I (Required)	3
CS 122	Crow Social Familial	3
CS 211	Thought and Philosophy	3

Science - (7 to 8 credits must be completed – one Life science and one Physical science)

SC 110	Principles of Biology/Lab	Life	3+1
SC 112	Biodiversity/Lab	Life	3+1
SC 121	Fundamentals of Gen Chemistry/Lab	Physical	3+1
SC 101	Mysteries of the Sky	Physical	3
SC 116	Physical World Around Us/Lab	Physical	3+1

Math - (4 credits must be completed)

MA150	Finite Math	4
MA165	Pre Calculus	4

Information Systems

IS 101-103	Introduction to Computers	3
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Humanities – (3 credits must be completed)

CA 106	Intro to Literature	3
CA 108	Literature of the American Indian	3
HU 101	Survey of Humanities	3

Social Science – (3 credits must be completed)

PY 101	General Psychology	3
SS 101	Introduction to Sociology	3
AN 111	Cultural Anthropology	3

TOTAL CREDITS 35

TWO YEAR PLAN OF STUDY**FALL – Year One**

IS 104 Spreadsheet	1
IS 105 Database	1
Core Requirements	15
	<hr/>
	17

FALL – Year Two

CP 255 Programming II	3
IS 211 HTML/Web Publish.	3
MA181 Calculus I	4
Core Requirements	<u>10</u>
	20

SPRING - Year One

IS 220 Database Programming	3
IS 250 Structured Bus. Program.	3
IS 221 Numerical Anal/Spreadsheet	3
CP 254 Programming I	3
Core Requirements	4
	<hr/>
	16

SPRING – Year Two

CP 257 Visual Basic Program.	3
CP 256 Advanced Program.	3
IS 220 Database Programming	3
Core Requirements	6
	<hr/>
	15

COURSE DESCRIPTION**IS 104 – Spreadsheet**

Introduces student to spreadsheet application software (Microsoft Excel or equivalent) and its use for solving numerical analysis problems and graphing.

IS 105 – Database

Introduces students to relational database management systems using Microsoft Access or other PC based software. Also covers use of Presentation Management software for use in preparing view-graphs and other visual aids for presentation.

IS 220 – Database Programming

Covers design and implementation of microcomputer databases using a relational database management system such as MS Access, Corel Paradox or Oracle. This course involves extensive hands-on use of the database software used and covers basic design of table structures, queries, reports, and forms, as well as data normalization concepts. Query design will include use of QBE (Query By Example) and SQL as well as introduction to macros.

Prerequisites: IS 101-105 (IS 104 and 105 may be taken concurrently)

IS 221 – Numerical Analysis/Spreadsheets

An advanced spreadsheet course covering numerical analysis using microcomputer spreadsheets. This course examines and applies spreadsheets to various common business and scientific related numerical analysis problems. Specific problems will deal with time and value of money; annuities budgeting, use of specialized financial functions, use of scientific functions, use of specialized data analysis tools in statistics, Internet data input, graphing, and macros.

Prerequisites: IS 101-104 (IS 104 may be taken concurrently), MA 105.

IS 250 – Structured Business Programming

An introductory course in the use of structured concepts/approaches for problem solving, programming and data presentation. Topics include the history of computer programming languages, program development procedures, logic and design tools to include flowcharts, structured flowcharts and pseudo code. Other areas of discussion are simple loops, counters and truth functional logic and decision tables. Students gain hands-on programming experience with a structured programming language such as Pascal, Visual Basic or C.

Prerequisites: IS 101-104 (IS 104 may be taken concurrently), MA 105 or consent of instructor.

IS 211 – HTML and Web Page Design

Introduces student to web page design fundamentals using “top down” approach. Emphasis is on understanding and application of sound design rules, use of white space, graphics, site maps, two-way data entry/retrieval, and links. Hands-on portion of the course begins with editor and Hypertext Markup Language (HTML), progresses to web design using Page development tools such as Publisher, Netscape Composer, and Microsoft Front Page. Also covered are aspects of web page/site publication and management.

Prerequisites: IS 101-103

BU 221 – Principles of Accounting I

An introduction to the principles of financial accounting for students of all business curricula. Specific topics include accounting concepts, recording transactions, worksheet and financial statement preparation, accounting systems, cash, receivables, inventory, long-term assets, liabilities, corporation, and analysis of financial statements.

CP 254 – Programming I

Implementation of structured programming designs in procedural language such as Pascal, Turbo Pascal or other 3rd generation high-level language. Emphasis on problem solving and algorithm development using the control structure abstractions of sequence, repetition, and selection. Other areas covered are structured program design, coding, debugging, testing and documentation as well as development of sound programming style.

Prerequisites: IS 101-103, CP 100

CP 255 – Programming II

Implementation of programming designs in a procedural language such as C or other high level 3rd generation language. Introduces advanced data types, abstract data types, queues, stacks, trees, sorting, data structure properties, problem solving and algorithm development in addition to use control structure abstractions of sequence, repetition, and selection.

Prerequisites: IS 101-103, CP 254

CP 256 – Advanced Programming – Java, Oracle

Application of programming techniques with object oriented language such as C++, Delphi, Java. Introduces classes and object manipulations in concert with standard control structures, data types, and elements used in procedural languages.

Prerequisites: (CP 254 may be taken concurrently with CP 256)

CP 257 – Visual Basic Programming

Introduces student to the Visual Basic programming language for microcomputers. Covers basics of sound structured program design, object based programming, logic data structures including single and multi-dimensional arrays, user interface design in a Visual (Windows) environment, Visual Basic naming conventions, procedure and function implementation.

Prerequisites: IS 250 or CP 100 (may be taken concurrently), MA 105

MA 181 – Calculus I

Topics in Calculus I include: functions, elementary transcendental functions, limits and continuity, differentiation, applications of the derivative, curve sketching, analytic geometry and integration.

Prerequisite: MA 165 or equivalent

IS 210 – Desktop Publishing/Computer Graphics

This course is designed to give the student an in-depth understanding of Desktop Publishing concepts and the computer software package Microsoft Publisher for Windows 9x. The student will become familiar with desktop publishing and advertising concepts such as proper page layout, target advertising, proper use of white space, proper use of scanned images proper use of graphics and integration of other software package outputs with Publisher. The course objectives will be accomplished through a hands-on “learning by doing” approach. The student will complete real world assignments such as Business Letterheads, Business Cards, Travel Brochures, Newsletters and other challenging assignments.

Prerequisites: IS 101 – 103 (IS 103 may be taken concurrently)

IS 241 – Computer Network Fundamentals

Covers topics on multi-user operating systems with emphasis on computer local area networks (LAN). Emphasis is placed on LAN architectures, network administration tools, communication protocols, elements of networks and network administration considerations.

Prerequisites: IS 101 – 104

IS 240 – Tech Troubleshooting

IS 260 – Geographic Information Systems

Introduction to PC based geographical information systems including aspects of mapping, GIS databases, coordinate systems, scaling, and resolution, 3D to 2D conversions, data collection, and information retrieval. Students gain hands-on experience with PC based GIS systems such as MapInfo, ScanUS, ArcView. This course will also cover application and use GIS concepts in business, cultural and scientific applications and is intended to fulfill one of the optional elective courses in IS.

Prerequisites: IS 101-105 (IS 104 and 105 may be taken concurrently), MA 105

Notes:

HARDIN HIGH SCHOOL

GRADUATION REQUIREMENTS (20 Credits to Graduate)

English	4 credits
Mathematics	3 credits
Science	2 credits
Health & P.E.	2 credits
Social Science	2 credits
Fine Arts	1 credit
Vocational	1 credit
Electives	5 credits

PLAN OF STUDY

	<u>Required</u>	<u>Elective</u>	<u>Credits</u>	<u>Recommended Elective Courses for Computer Science at LBHC</u>
Freshman:				
English I	√		1	
Math	√		1	
Earth Science	√		1	
P.E./Health	√		1	
Intro to Vocations	√		1	
Sophomore:				
English II	√		1	
Math	√		1	
Biology	√		1	
P.E./Health	√		1	
Elective		√	1	
Junior:				
English III	√		1	
Math	√		1	
American History	√		1	
Electives		√	2	Computer Literacy 1 Math
Senior:				
English IV	√		1	
American Government	√		1	
Electives		√	3	Computer Literacy 2 Advanced Computer Topics, Math, Chemistry or Advanced Biology

JUNIOR YEAR:		<i>Hardin High School</i>		
			Required	Recommended
	English III		X	
	Math		X	
	American History		X	
	Math			X
	Computer Literacy 1			X

SENIOR YEAR:		<i>Hardin High School</i>		
			Required	Recommended
	English IV		X	
	American Government		X	
	Math			X
	Computer Literacy 2			X
	Advanced Computer Topics			X
	Chemistry or Advanced Biology			X

COURSE DESCRIPTION

Recommended Elective Courses for Major Course of Study in Computer Science at Little Big Horn College

Computer Literacy 1

This one semester course provides the student with an opportunity to explore computers and their uses by way of contemporary programs. The student will be expected to work with integrated programs and to learn the basics of computer graphics. The student will be expected to develop presentation-style projects with the use of multimedia applications, involving the blending of graphics, sound and text. Reading and thinking assignments are an integral part of the course.

Prerequisite: Have taken Keyboarding or Word Processing

Computer Literacy 2

This one semester course provides further opportunities for the student to continue the exploration of computers and computer applications. Emphasis will be on introduction to desktop publishing, electronic publishing, and introduction to telecommunications. As time and resources allow students to work with e-mail, electronic file exchange, and research techniques on the Internet.

Prerequisite: Computer Literacy 1 or Instructor Approval

Advanced Computer Topics

Students may register for this class for up to six semesters. The first school year that they enroll in the class they will concentrate on illustration and image editing applications using Adobe Illustrator and/or Adobe Photoshop. Computer peripherals such as the scanner and digital camera will be utilized. Some activities in telecommunications and web page design will be incorporated into the course content.

Prerequisite: Completed Computer 1, 2 and/or completed Alternative School Computer Module with at least a "C" grade.

Student who continue to take sections of Computer Topics will be given the opportunity to select from a variety of topics that may include programming languages, presentation software applications, multimedia and animation, and more advanced authoring for the Web.

Advanced Biology

A course which concerns human anatomy and physiology. Course content will include the structures and functions of every major system in the human body, which include: Skeletal, Muscular, Nervous, Digestive, Respiratory, Cardiovascular, Urinary, Endocrine and Lymphatic. For safety, the instructor must be informed, either directly or indirectly, of any student that is pregnant or becomes pregnant so that alternative activities may be provided.

Prerequisites: Biology and instructor approval – chemistry recommended

Chemistry

A course to give the students a working knowledge of basic chemistry and the ability to explain natural phenomenon of the universe around them. Basic for all students interested in a science related career. The instructor must be informed, either directly or indirectly, of any student that is pregnant or becomes pregnant so that alternative activities may be provided. It is recommended that students have a graphing calculator for this course.

Prerequisites: "C" in IM2 or Alg. 1 & completed or currently enrolled in IM4 or Alg. 2 or instructor approval.

Program of Study Engineering Packet

Little Big Horn College does not offer a pre-engineering program of study. If a student is interested in pursuing a career in engineering it is suggested that the student follow the general science worksheet on page 24 of this booklet, then transfer to Montana State University-Bozeman.

Programs of Study Math Packet

Listed below are the individual programs of study offered at Little Big Horn College that have been cross-referenced to several four year degrees. If the student's math career of choice is not listed below, feel free to contact a consultant to discuss a proper plan of study.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts in Mathematics	Mathematics Mathematics Education	MSU-Bozeman MSU-Billings Rocky U of Montana

ASSOCIATE OF ARTS IN MATHEMATICS

The Mathematics program of study is designed to prepare a student for entry-level studies in math, science, computer science, engineering and teaching mathematics at the secondary level. The courses are parallel to meet the needs of the student who will transfer to a four-year degree program.

Program of Study

CP 254	Programming I	3
CP 255	Programming II	3
IS 104	Spread Sheet	1
IS 105	Dbase	1
IS 250	Structured Bus.Prog.	4
MA 181	Calculus I	4
MA 182	Calculus II	4
MA 213	Elementary Stats	3
SC 131/135	Adv. Gen. Chem I/Lab	4
SC 132/136	Adv. Gen. Chem II/Lab	4

Total Program Credits 30

35 CORE Requirements + 30 Program of Study = 65

TWO-YEAR PLAN OF STUDY: MATHEMATICS

<u>Fall</u>	<u>Year 1</u>		<u>Spring</u>	<u>Year 1</u>	
IS 104	Spread Sheets	1	IS 250	Structured Bus. Prog.	3
IS 105	D Base	1	CP 254	Programming I	3
SC 131/135	AdvGenChem/Lab I	4	SC 132/136	AdvGenChem/Lab II	4
CORE Requirements		11	MA 216	Elem. Stats	3
			CORE Requirements		3
<u>Fall</u>	<u>Year 2</u>		<u>Spring</u>	<u>Year 2</u>	
CP 255	Programming II	3	MA 182	Calculus II	4
MA 181	Calculus I	4	CORE Requirements		11
CORE Requirements		10			

Hardin High School Suggested Plan of Study

The following courses are suggested for a smooth transition from Hardin High School into the Little Big Horn College math curriculum. The classes that apply for the associate of arts degree in mathematics at LBHC are listed below. Other classes that are listed are required for graduation and/or are a part of the college preparation program at Hardin High School.

For all Associates of Arts in Mathematics

<u>Freshman</u>	<u>Sophomore</u>
English 9 or 9H	English 10 or 10H
Math **(see below)	Math** (see below)
Intro to Vocations	Health/P.E.
Health/P.E.	Biology
Earth Science	Global Studies
<u>Junior</u>	<u>Senior</u>
English 11 or 11H	English 12 or 12AP
Math**(see below)	Math** (see below)
American History	American Government

To fulfill a college preparatory curriculum, the student should take two years of electives selected from the following:

- Foreign Language
- Computer Science
- Visual and Performing Arts
- Vocational Education units which meet the Office of Public Instruction guidelines.

****Any one of the following math tracks will prepare a student for the transition into the math curriculum at LBHC.**

1. Algebra I→Algebra II→Pre-calculus→Calculus
2. Geometry→Algebra II→Pre-calculus→Calculus
3. Adv.IM2→Adv. IM4→IM6→Calculus

****For a math major, Calculus should be the ultimate goal in high school. At minimum, the student shall take four (4) years of math reaching the level of Pre-calculus or IM6 in his/her high school math studies for a serious pursuit of a degree in Math.**

Suggested Electives:

Physics is suggested for students interested in any general science or engineering science related career.

Chemistry is recommended for any student entering into a biological or chemical engineering field.

Computer Literacy I & II are recommended for any student interested in a programming related field.

Little Big Horn College Math Course Descriptions

MATH 061 Basic Mathematics 3 credits FS

This class covers the basic mathematical concepts of addition, subtraction, multiplication and division of fractions. Decimals, percents, proportions, conversions and rounding will be covered. This course is designed to prepare students for business math and elementary algebra.

Prerequisite: Math placement test, scores less than 10 correct on the ASSEST test.
Non-transferable.

MATH 071 Pre-Algebra 4 credits FS

This course is designed to teach students the fundamental mathematical concepts needed to be successful in college level mathematics courses. Topics covered include: a review of basic operations of arithmetic, with emphasis of properties basic to algebra, integers, and rational expressions – multiplying, dividing, adding, subtracting and factoring. Also covered are exponents, and linear equations, inequalities and graphing, polynomials and rational expressions will also be covered.

Prerequisite: MATH 061 or math placement test, scores between 11 and 17 on the ASSEST test.
Non-transferable.

MATH 081 Algebra 4 credits FS

This class covers the topics of graphs of linear equations and inequalities, systems of linear equations, and square roots, properties of real numbers; linear equations and inequalities in one variable, graphing linear equations and inequalities, systems of linear

equations and inequalities in two or three variables; exponents, roots and radicals; polynomials and algebraic functions; quadratic equations and inequalities in one variable and graphing quadratic equations and inequalities.

Prerequisite: MATH 071 or math placement test, scores between 18 and 25 on the ASSEST test.

Non-transferable.

MATH 105 Algebra for College Students 4 credits FS

This class covers the topics of functions and their graphs, including polynomial and rational functions, radical functions, exponential and logarithmic functions. Absolute value equations and inequalities, compound inequalities; complex numbers; systems of second degree equations and inequalities; conic sections, matrices and determinants. Mathematical induction and the Binomial Theorem are included.

Prerequisite: MATH 081 or math placement test, score of 26 or more on the ASSEST test.

Transferable.

MATH 150 Finite Math 4 credits FS

Finite Math is a course that covers topics with applications to the natural science, social sciences, and liberal arts. The topics covered in this class include: basic math skills and cultural implications of topics in mathematics, including number systems, geometric, algebraic, financial and trigonometric models; measurement; probability and descriptive statistics; and calculus. This course introduces students to areas of interest in applied and pure mathematics. Intended for students wishing to satisfy the general education mathematics requirement.

Prerequisite: MATH 105 or math placement test, score of 26 or more on the ASSEST test.

Transferable.

MATH 165 Pre-Calculus 4 credits FS

The topics covered in this class include functions, graphs, and the use of symbols for expressing mathematical thoughts, polynomials, rational, exponential, logarithmic, and trigonometric functions. Required only of students who want to take MATH 181 and whose placement test shows a need for further study of this material.

Prerequisite: Successful completion of MATH 105 or equivalent.

Transferable.

MATH 181 Calculus I 4 credits F(alternate years, 2001)

Topics in Calculus I include: functions, elementary transcendental functions, limits and continuity, differentiation, applications of the derivative, curve sketching, analytic geometry and integration.

Prerequisite: Successful completion of MATH 165 or equivalent.

Transferable.

MATH 182 Calculus II 4 credits S(alternate years, 2002)

This class includes: methods of integration, applications of the integral, first order differential equations, Taylor polynomial and series.

Prerequisite: Successful completion of MATH 181.

Transferable.

MATH 216 Elementary Statistics 3 credits S

Conventional notation and equations are used to explain traditional and robust estimates of location; and variability, fundamentals of probability theory, confidence intervals and test of hypothesis for normal distributions.

Prerequisite: Successful completion of MATH 105.

Transferable.

Student STEM Worksheet for Hardin High School

Mathematics

The following worksheet is to help you plan your high school studies to ensure the best possible transition to the college level of studies to pursue a career in mathematics. Math degrees can allow for careers in fields such as science, physics, statistics, education, and engineering. First of all, following the given plan of study for Hardin High School will allow the best advantage for entering into college. This will provide a solid background for pursuing your college degree. Suggested electives to be taken include physics, chemistry, and computer literacy. Physics is a course that allows you to study the applied mathematics involved in the world around us. Chemistry is a science class involving a large magnitude of mathematics to understand chemical, physical, and biological changes in our world. Computers are involved with many careers today. Gaining as much knowledge about them is a tremendous advantage to you. Computers are used in a variety of ways including: analyzing data, gaining statistics, preparing reports and communicating with other colleagues. Programming is another career that uses a large amount of math. Each of the courses listed in the program of study will be beneficial and will give you an advantage when pursuing your college degree.

The following checklist is in accordance with the plan of study given previously. Place a check in the appropriate space below to keep track of the courses you should to take before or during your junior and senior years.

Course	Successful Completion
English 11 or 11H	_____
English 12 or 12AP	_____
{ Algebra II	_____
{ Pre-Calculus	_____
{ Calculus	_____
Or	
{ IM4 or Adv. IM4	_____
{ IM6	_____
{ Calculus	_____
Chemistry	_____
Physics	_____
Global Studies	_____
American History	_____
American Government	_____
Computer Literacy 1	_____
Computer Literacy 2	_____

STEM Science, Technology, Engineering, and Math Packet
2000-2001

CROW INDIAN STEM PROJECT
Funded by the American Indian Science and Technology Education
Consortium

Prepared for Lodge Grass High School

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STEM Science and Engineering Packet

2000-2001

CROW INDIAN STEM PROJECT

Funded by the American Indian Science and Technology Education Consortium

Purpose

The purpose of the Crow Indian STEM (Science, Technology, Engineering, and Math) Project is to aid students in preparing for a career in science, technology, engineering, or math. This system utilizes “two plus two plus two” agreements between Crow Reservation high schools, Little Big Horn College, and the four-year universities in Montana. These agreements have been designed to help prepare high school students for college through careful selection of coursework for science and technology based careers.

Consultants from Little Big Horn College have examined course descriptions and objectives offered by your high school and have derived suggested plans of study for students interested in science, technology, engineering, or math to be taken during the students’ junior and senior years (the first “two”). The goal is to help students make the transition from high school to Little Big Horn College in the disciplines of math and science; that is to bring down the boundaries between high school and college level math and science.

The next portion of the agreement (the second “two”) is between the faculty of Little Big Horn College and the students. Upon matriculation into LBHC, the students will follow a suggested plan of study developed as appropriate, relevant, and transferable to a four-year institution that offers a career based four-year degree. This gives the students’ the advantage of attending a college within their community while preparing them for transfer to a four-year institution.

The final “two” in this agreement is between Little Big Horn College and the Montana University System. After leaving Little Big Horn College with an associates degree, your students will spend two years at a four-year university completing their degree. The consultants from LBHC have ensured that all suggested courses are transferable from LBHC to the Montana University System.

As an example, suppose a student tells his or her high school instructor or counselor that he or she has an interest in medicine. The instructor or counselor will consult the STEM packet designed for that high school, and note that a suggested plan of study includes: mathematics through trigonometry and pre-calculus, two years of biology, one year of chemistry, one year of physics, advanced composition, and information systems. The student can then choose those courses during registration. If the student has taken the suggested courses during junior and senior years, he or she should have a smoother transition into LBHC and a greater chance of succeeding the community health curriculum. The following two years at LBHC will be spent studying chemistry, biology, calculus, research writing, physics, and anatomy and physiology. This time will be used to hone the student's academic skills and prepare the student for transfer to MSU-Billings, MSU-Bozeman, Rocky Mountain College, or the University of Montana. Once the student has transferred from LBHC to one of these institutions, he or she will finish their four-year degree during the final two years of STEM and apply to medical school during their junior year of college.

In summary, the STEM project has been designed with a "two plus two plus two" agreement. The first two years were designed to prepare students for college. The second two years are spent at LBHC earning credit towards a four-year degree. The final two years are spent at one of the four-year universities in Montana.

Purpose of STEM

1. To help students prepare for college as soon as their junior year of high school.
2. To create a seamless transition from high school math and science to college level math and science.
3. To develop a career based plan of study to guide students from high school through completion of bachelor's degrees.
4. To train Crow students in science, technology, and math based careers, giving the students ownership of that knowledge, leading to increased opportunity on and off the Crow Indian Reservation.

Why STEM is Necessary

1. Technology, engineering, and science are all math based.
2. 40% of all career opportunities are math or science based.
3. Students spend an average of 3.7 years at Little Big Horn College pursuing a two-year degree.
4. One quarter to one third of all courses at Little Big Horn College are taught on a developmental level.
5. We want to set students on their way towards a career so they do not waste their precious time and financial aid on excess years at LBHC.

Why We Need Your Help

1. 65% of all Crow high school students from Lodge Grass, Plenty Coups, St. Labre, and Hardin attend Little Big Horn College after high school.
2. College level courses are at least a year away from almost all LBHC entering freshmen.
3. Students choose their high school courses based on lack of information, ease, or to “float” to graduation.
4. We want to influence students into taking gateway courses that will open opportunity to our Crow students.

Working with you, we have developed a suggested plan of study that informs students which courses they should take in preparation for matriculation at Little Big Horn College with a specific career in mind. This plan of study consists of a packet that has been custom designed for your high school and specific career goals. The individual packets have been arranged according to Science, Technology, Engineering, or Math. This enables students to enter LBHC better prepared for a specific career or field. At LBHC we will prepare the students for a four-year university while teaching the freshman and sophomore curricula. The final phase is completion of a STEM based four-year degree.

Contacts

Below is a list of contacts at Little Big Horn College. Please feel free to call or email us regarding any questions.

Collena Caplett , STEM coordinator	638-3181	<u>caplett@looksmart.com</u>
Willis Tsosie , Technology consultant	638-3133	<u>wtosie@main.lbhc.cc.mt.us</u>
Maxine Hamburg , Technology consultant	638-3130	<u>maxine@main.lbhc.cc.mt.us</u>
Jana Brockie , Math consultant	665-1908	<u>jfh2os@yahoo.com</u>
Kris Cunningham , Science and Engineering consultant	638-3136	<u>kris@main.lbhc.cc.mt.us</u>

Programs of Study

On the following pages are the individual programs of study for science offered at Little Big Horn College. Each section starts with a series of options that students may choose from at each Montana university. A course outline of the appropriate program of study is listed in the next section. This is followed by a suggested plan of study for preparing high school students for matriculation into LBHC.

Which Program Do I Choose?

Listed below are the individual programs of study offered at Little Big Horn College that have been cross referenced to several four year degrees. If the student's science career of choice is not listed below, feel free to contact the consultant to discuss a proper plan of study.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts	Nursing	MSU-Bozeman
Pre-nursing option	Pre-Physical Therapy*	MSU-Billings MSU-Bozeman Rocky
	Pre-Medicine and Pre-Medical Science*°	MSU-Billings MSU-Bozeman Rocky U of Montana
	Pharmacy*	U of Montana
	Physical Therapy*°	U of Montana

*Denotes that the SC 131/135 & SC 132/136 Advanced Chemistry I & II should be taken instead of SC 121/125 & SC 122/126 Intro to Gen Chem & Intro to Biochem.

°It is suggested that students interested in these classes also complete MA 181 & MA 182 Calculus I & II prior to matriculation into a four year college.

LBHC Program of StudyAssociate of Arts
Community Health**Four Year Degree**

Community Health*

Offered At

MSU-Bozeman

Dietetics*

MSU-Bozeman

Health Enhancement*
Teaching

MSU-Bozeman

Human Services

MSU-Billings

Rehabilitation and
Related Services

MSU-Billings

*Denotes SC 121/125 & SC 122/126 Intro to Gen Chem & Intro Biochem are required for degree

LBHC Program of StudyAssociate of Arts
Natural Resources/
Environmental Science**Four Year Degree**Fish and Wildlife
Management**Offered At**MSU-Bozeman
U of MontanaEnvironmental*
Health/ScienceMSU-Bozeman
Rocky
U of Montana

Microbiology*

MSU-Bozeman

Forestry

U of Montana

Resource Conservation

U of Montana

*Denotes that SC 131/135 & SC 132/136 Advanced General Chemistry I & II are required for these degrees.

LBHC Program of StudyAssociate of Arts
General Science**Four Year Degree**

Biology*°

Offered AtMSU-Billings
MSU-Bozeman
Rocky
U of Montana

Chemistry*°

MSU-Billings
MSU-Bozeman
Rocky
U of Montana

Geohydrology*°

MSU-Bozeman

LBHC Program of Study

Associate of Arts
General Science

Four Year Degree

Geology*°

Offered At

Rocky
U of Montana

*Denotes that SC 131/135 & SC 132/136 Advanced General Chemistry I & II are required for these degrees.

°Denotes that MA 182 Calculus II is required for these degrees.

Little Big Horn College Programs Of Study

ASSOCIATE OF ARTS IN SCIENCE: PRE-NURSING OPTION

This program of study is for those students who are pursuing a degree as a Registered Nurse and wish to earn an Associate of Arts Degree prior to receiving a two-year or four-year degree at another institution. Fulfilling LBHC requirements will allow a student to acquire many of the courses offered in two-year RN programs, or prepare for transfer to a four-year institution at the junior level.

To earn a degree in Science: Pre Nursing Option, a student must complete the core Requirements as well as the courses listed below:

Program of Study

PY 201	Lifespan Development	3
SC 212/213	Microbiology and Disease/Lab	4
SC 210	Anatomy and Physiology/Lab	4
SC 211	Anatomy and physiology/Lab	4
SC 214	Nutrition	3
SC 122/126	Intro to Biochemistry/Lab	4
SS 101	Sociology	3
Total Program Credits		25

35 Credits CORE + Program of Study 25 = 60 Credits

TWO YEAR PLAN OF STUDY: PRE-NURSING OPTION

Fall Year 1

SC 121/125	Intro to Gen Chem	4
SC 110	Principles of Bio/Lab	4
CORE Requirements		9

Spring Year 1

SC 122/126	Intro to BioChem/Lab	4
PY 201	Lifespan Develop	3
CORE Requirements		9

Fall Year 2

SC 210	Anatomy & Phys.	4
CORE Requirements		9

Spring Year 2

SC 211	Anatomy & Phys.	4
SC 212/213	Micro & Disease	4
SS 101	Sociology	3

ASSOCIATE OF ARTS DEGREE IN SCIENCE: COMMUNITY HEALTH

This program of study is concerned with improving health and well-being for the promotion of healthful lifestyles, community actions for health, and conditions that make it possible to live healthy lives. Students can transfer to a four-year institution to complete this degree that will prepare them for entry level employment related to community health.

Program of Study

HE 201	Wellness	3
HS 111	Chemical Dependency	3
SC 210	Anatomy and Physiology I	4
SC 211	Anatomy and Physiology II	4
SC 212/213	Microbiology & Disease/Lab	4
SC 214	Nutrition	3
SC 244/245	Environmental Science/Lab	4

Total Program Credits 25

35 Credits CORE + 25 Program of Study = 60 credits

TWO YEAR PLAN OF STUDY: COMMUNITY HEALTH

Fall	Year 1		Spring	Year 1	
HS 111	Chemical Dependency	3	HE 201	Wellness	3
Core Requirements		11	SC 244/245	Environ.Sci	4
			Core Requirements		9

Fall	Year 2		Spring	Year 2
SC 210 Anatomy & Phys. I	4		SC 211 Anatomy & Phys. II	4
CORE Requirements	9		SC 212/213 Micro/Lab	4
			SC 214 Nutrition	3
			CORE Requirements	6

ASSOCIATE OF ARTS DEGREE IN : NATURAL RESOURCES/ENVIRONMENTAL SCIENCE

Natural Resource Management is a broad field where professionals work to preserve, conserve and manage natural resources. Careers may be in fish & wildlife, forestry, range management, agriculture, national parks, or many other areas. Environmental science careers focus on environmental protection and rehabilitation from harmful human impacts, such as overgrazing, mining and pollution. Careers may be in environmental science, land or water resources, reclamation, or many other areas.

Program of Study

SC 102 Ecology+Lab	4
SC 112 Biodiversity	4
One of the following:	
SC 122 Intro to Biochemistry	4
SC 132 Adv.Gen Chem II	4
SC 244 Environmental Science+Lab	4
MA 216 Elementary Statistics	3
Additional credits (as listed here)	7-8

Natural Resource majors take two

SC 203 Rangeland Resources/Lab	4
SC 202 Identification Seed Plants	4
SC 205 Soils	4
IS 260 GIS/GPS	3
SC 276 Internship	4

Environmental Science majors take two

SC 104 Geology + Lab	4
SC 202 Identification of Seed Plants	4
SC 205 Soils	4
IS 260 GIS/GPS	3
SC 276 Internship	4

Total Credits: 26-27

Also recommended: IS104/105 Intro to Computers, BU220 Economic Way of Thinking
35 core Requirements + 26-27 Program of Study = 61-62

TWO YEAR PLAN OF STUDY: NATURAL RESOURCES/ENVIR. SCIENCE

* Denotes Core classes that MUST be taken for this major.

Students pursuing natural resources careers usually take the SC121 chemistry sequence; those interested in environmental science careers take the SC131 chemistry sequence. Freshmen should complete writing and information systems requirements in year one.

Fall Year 1

*SC 110 Principles of Biology + Lab	4
Core requirements	12

Spring Year 1

SC 112 Biodiversity + Lab	4
*MA 165 Pre Calculus	4
Science elective	3-4
Core requirements	6

Fall Year 2

*SC121 or SC131	4
SC 102 Ecology	4
Science elective	3-4
Core requirement	3

Spring Year 2

SC 244 Environmental Sci.	4
SC 122 or 132 Chemistry	4
MA 216 Statistics	3
Core requirement	3

ASSOCIATE OF ARTS IN SCIENCE: GENERAL SCIENCE OPTION

The General Science Option is designed for the student planning transfer to a four-year college in science. This option provides a solid background in a variety of science fields including pre-professional health careers and secondary science education. The student will be assigned an advisor from the science faculty depending on the student's area of interest.

Program of Study

*MA 181	Calculus I	4
MA 216	Elem Statistics	3
**SC 121/125	Intro to Gen Chem/Lab	4
SC 122/126	Intro to Biochemistry/Lab	4
Or		
**SC 131/135	Adv. Gen. Chemistry/Lab I	4
SC 132/136	Adv. Gen Chemistry/Lab II	4

Choose four (4) of the following courses for 12-14 credits

SC 102/103	Ecology/Lab	4
SC 110/111	Principles of Biology/Lab	4
SC 112/113	Biodiversity/Lab	4
SC 210	Anatomy & Physiology I	5
SC 211	Anatomy & Physiology II	5
SC 213/213	Micro & Disease/Lab	4
SC 244/245	Environmental Science/Lab	4

*Fulfills group requirement for math

**Fulfills group requirement for science

35 CORE Credits + 23-25 Program of Study Credits = 58-60

TWO YEAR PLAN OF STUDY: GENERAL SCIENCE OPTION

Fall Year 1			Spring Year 1		
SC	Chemistry Sequence	4	SC	Chemistry Sequence	4
MA 181	Calculus I	4	MA 216	Elem. Statistics	3
Core Requirements		9	Core Requirements		9
Fall Year 2			Spring Year 2		
SC	Science Elective	4	SC	Science Elective	4
SC	Science Elective	4	SC	Science Elective	4
Core Requirements		6	Core Requirements		3

Lodge Grass High School Suggested Plan Of Study

The following courses are suggested for a smooth transition from Lodge Grass High School into the Little Big Horn College science curriculum. These are not requirements; these are suggestions.

For all Associates of Arts in Science Options:

Junior Year

English III
Algebra II, Algebra III[°]
Chemistry

Senior Year

English IV
Pre-calculus/Trigonometry*
Advance Biology
Physics

*Denotes that the student should try to achieve this level in math by the appropriate year.

°Denotes that the student should achieve this level by senior year.

For Pre-Nursing Option:

Physics is suggested for students interested in a pre-physical therapy, pre-medicine, and pre-medicinal science. Physical education/weight training and aerobics are also suggested for these students.

For Community Health Option:

Child development is suggested as well as physical education.

For Natural Resources/Environmental Science Option:

Biology II is very strongly recommended for students interested in any degree related to this option. If time allows, suggest that students also take vocational agriculture I, II, and III.

For General Science Option:

Physics is strongly suggested as well as the criteria from above.

Little Big Horn College Science Course Descriptions

SC 050 Survival Chemistry

1 cr F

Basic fundamentals of chemistry as it applies to biology. Recommended for students with no previous chemistry, or who would like a brief review of chemistry, and who are taking or will be taking SC111, SC112, SC113, SC 242 or SC244. Open to any student. There are fifteen class periods for the first four weeks of the quarter.

SC 101 Mysteries of the Sky

3 cr F/S*

A non-mathematical survey of the Universe, from our planet Earth, our neighboring planets and the sun, outward to the constellations, our galaxy and the Universe beyond. Includes sun spots, comets, black holes, quasars and cosmology. Recent discoveries will

be presented. Students will learn how to handle a telescope and one mandatory night laboratory is included.

SC 102 Ecology

3 cr F (2001)

Students will develop an understanding of how the natural world works by studying the relationships among plants, animals and other living things and between living things and their environments. The course will explore how species evolve, and the composition, function and distribution of populations, communities and ecosystems. It is recommended that students without a high school chemistry background enroll in SC 050 Survival Chemistry prior to enrolling in SC 102.

SC 103 Ecology Lab

1 cr F (2001)

Ecology Lab accompanying SC 102 Ecology.

SC 104 Introduction to Geology

3 cr S

This course covers minerals, rocks, geologic time, heat, volcanism, earthquakes, magnetism, gravity and mountain building processes as related to plate tectonics and land forms. Weathering, glaciers, rivers, oceans and beaches are introduced.

SC 105 Introduction To Geology Lab

1 cr S

Laboratory to accompany SC 104. Includes field trips.

SC 110 Principles of Biology

3 cr F

This course addresses biological principles common to living things. The course content includes cell structure, function, metabolism and reproduction. Energy pathways, basic genetics, evolution, classification, diversity and ecology are included in the course. The lab is a required co-requisite. Student who do not have a chemistry background are strongly advised to enroll in SC 050 Survival Chemistry.

SC 111 Principles of Biology Lab

1 cr F

Laboratory to accompany SC 110. Includes laboratory experiments related to course work in SC 110 Principles of Biology.

SC 112 Biodiversity

3 cr S

Biodiversity is an overview of the diversity of life, examining bacteria, protists, fungi, plants and animals, with an emphasis on animals and vascular plants. Classification, survival strategies, reproduction ecological importance and comparison of biological systems are a part of the course content. The lab is a required co-requisite.

SC 113 Biodiversity Lab

1 cr S

The Biodiversity lab includes laboratory experiments related to course work in SC 112 Biodiversity.

SC 116 Physical World Around Us**3 cr F/S**

This course is intended for education majors and non science majors. This course introduces students to the fundamentals of chemistry, physics, and earth science and their roles in our understanding of the world. This course explores the impacts of each on our society.

SC 117 Physical World Lab**1 cr F/S***

Lab that corresponds with SC 116

SC 121 Introduction to General Chemistry**3 cr F (2000)**

This is an introductory chemistry course designed for pre-nursing students and students lacking a strong background in chemistry. This course will cover general chemistry including: atomic structure, periodicity, chemical bonding, chemical reactions, acid-base systems, thermodynamics, and the behavior of gasses, liquids, solids, and solutions. This course will also cover selected topics in organic chemistry including: nomenclature, functional groups, organic synthesis, and the structure and role of organic molecules.

SC 122 Introduction to Biochemistry**3 cr S (2001)**

This course is the second half of the introductory chemistry for pre-nursing students and non-science majors. This course will cover functional groups of organic molecules and discuss their role in the synthesis of biomolecules. Other topics included are: the role of biological molecules such as carbohydrates, lipids, proteins, nucleic acids, and metabolic processes and cellular structure.

SC 125 Introduction to General Chemistry Lab**1 cr F (2000)**

Lab that corresponds with SC 121

SC 126 Biochemistry Lab**1 cr S (2001)**

Lab that corresponds with SC 122

SC 131 Advanced General Chemistry I**3 cr F (2001)**

This course introduces students to the fundamental concepts of chemistry. This includes atomic structure, stoichiometry, chemical bonding, and laws governing the relationships of elements and compounds.

SC 132 Advanced General Chemistry II**3 cr S (2002)**

This course is a continuation of SC 131. It covers solubility, equilibria, entropy, free energy, electrochemistry and inorganic descriptive chemistry.

SC 135 Advanced General Chemistry I Lab**1 cr F (2001)**

Lab that corresponds with SC 131

SC 136 Advanced General Chemistry II Lab**1 cr S (2002)**

Lab that corresponds with SC 132

SC 202 Seed Plants**3 cr F (2002)**

The course will introduce the student to trees, shrubs and herbaceous flowering plants in the local area. The student will collect and prepare plant specimens. Vocabulary, classification, nomenclature and the use of manuals (plant “keys”) will be a part of the course material. Half of course time will be devoted to lab and field exercises.

SC 203 Range Land Resources**3 cr F (2002)**

This course describes the world’s range lands as related to their historic, present and potential use. The course will include Plains grasslands. Special attention will be given to how range land uses affect the nutrient, biological and hydrological cycles around the world and how the ecosystems respond to change. Concepts related to ecological conditions, land potential and ecological trends are introduced in the course material.

SC 204 Range Land Resources Lab**1 cr F (2002)**

Lab accompanying SC 203 Range Land Resources

SC 205 Soils**3 cr S**

The Soils course acquaints the student with soil properties the components of ecosystems and landscapes. How knowledge of soils is applied to the management of agricultural, wildland and urban landscapes is a major part of the course work. The student will be made aware of the problems related to environmental science.

SC 210 Anatomy & Physiology I**4 cr F**

This course is the first in the A&P sequence. SC 110, Principles of Biology is a prerequisite. In this course the student will examine cellular structure, the integumentary system, the muscular system, the skeletal system, and nervous system, and the endocrine system if time allows. Lecture is three times per week focusing on physiology. One period per week is reserved for discussions related to anatomy. Field trips and lab experience incorporated into coursework.

SC 211 Anatomy & Physiology II**4 cr S**

This course is a continuation of SC 210. In this course the student will examine the endocrine, blood and lymph, cardiovascular, respiratory, urinary, digestive and reproductive systems. Lecture is three times per week focusing on physiology. One period per week is reserved for discussions related to anatomy. Field trips and lab experience incorporated into coursework.

SC 212 Microbes & Disease**3 cr S**

The prerequisite for this course is SC 110 Principles of Biology, as knowledge of cells is essential to the study of microbes. The course begins with a general history of microbiology and microscopes. An overview of the anatomy and physiology of bacteria, viruses, protozoan, and fungi is part of the course content. The remainder of the course is devoted to studying organ/organ system diseases, and the type of microbes that cause

them. Also included are concepts of immunity, and general laboratory procedures. Upon completing the course, the student should have a general knowledge of disease causing antigens, and how these organisms are handled in a lab setting.

SC 213 Microbes & Disease Lab

1 cr S

Lab accompanying SC 212

SC 214 Nutrition

3 cr S (2002)

This course covers the basic concepts of human nutrition as related to health and food consumption at the different stages of the life cycle. In addition, nutritional assessment and dietary modifications used in health and disease are also studied.

Prerequisites: SC110; SC 121 or 131

SC 244 Environmental Science

3 cr S

Environmental Science acquaints the student with the relationship between people and the environment and how human activities affect the earth's natural ecosystems. The course addresses environmental issues such as range and farmland practices, soil ecology, pests and pesticides and alternative methods of pest control, the water cycle and water pollution, air quality and air pollution, hazardous and solid waste management. The student will learn ways to reduce and prevent pollution, population management, protection of wild species, and how to sustain the earth's natural ecosystem upon which life depends.

SC 245 Environmental Science Lab

1 cr S

Laboratory experience accompanying Environmental Science

SC 276 Science Internship

OD

Provides student with the opportunity to apply theoretical knowledge in a work placement experience. Academic Advisor will assist student with work place placement and development of course objectives. Registration in this course is restricted.

Social Science

SS 101 Introduction to Sociology

3 cr S

This course is a survey of Sociology and designed to cover the study of society, organizations, social interactions, socialization, institutions, deviance and social control stratification, ethnic and racial minorities, gender and the family, education, religion and other topics from a sociological perspective.

Little Big Horn College Core Requirements

The following information is of general interest to the student. You should consult a four-year university catalog as well as contacting the STEM consultant to ensure that classes are chosen wisely when preparing your students for the adventure ahead. Listed on the next page are the core requirements; these should be chosen wisely to eliminate excess semesters when the students are ready to matriculate into Little Big Horn College.

CORE REQUIREMENTS

All students must fulfill the CORE REQUIREMENTS as a foundation to their programs of study. In order to graduate from LBHC, students will need to complete **35 credits in the following categories**. Advisors will assist the student with selection of Core Requirements. Courses may not be substituted for Core Requirements courses.

Category I: Communication Arts	Credits	Fall	Spring
*9 Credits must be completed in this category			
CA 101 Composition I	3	X	X
CA 102 Advanced Writing	3		X
CA 203 Research Writing	3	X	
CA 112-Public Speaking	3	X	X
Category 2: Crow Studies			
*6 Credits must be completed in this category			
CS 101 Crow Language I (Required)	3	X	X
CS 122 Crow Social Familial	3		X
CS 211 Thought and Philosophy	3	X	
Category 3: Science (must include one lab course)			
*7 to 8 Credits must be completed in this category			
One Life Science:			
SC 110 Principles of Biology /Lab	3+1	X	
SC 112 Biodiversity/Lab	3+1		X
One Physical Science:			
SC 121 Fundamentals of Gen Chemistry/Lab	3+1	X	
SC 101 Mysteries of the Sky	3	X	X
SC 116 Physical World Around Us / Lab	3+1	X	
Category 4: Mathematics			
* 4 Credits must be completed in this category			
MA 150 Finite Math	4	X	X
MA 165 Pre Calculus	4	X	X
Category 5: Information Systems			
*3 Credits must be completed in this category			
IS 101-103 Introduction to Computers	3	X	X
Category 6: Humanities			
*3 Credits must be completed in this category			
CA 106 Intro to Literature	3		X
CS 108 Literature of the American Indian	3	X	
HU 101 Survey of Humanities	3		X
Category 7: Social Sciences			
*3 Credits must be completed in this category			
PY 101 General Psychology	3	X	X
SS 101 Introduction to Sociology	3		X
AN 111 Cultural Anthropology	3		X
TOTAL CORE REQUIREMENTS:	35 CREDITS		

Student STEM Worksheet For Lodge Grass High School

Pre-Nursing & Medical Sciences

Pursuing a career in the medical field is a very admirable notion. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to become a nurse, a doctor, a veterinarian, an optometrist, a pharmacist, a dentist, a physical therapist, or pursue any other career in medicine it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Biology II will supplement the information you picked up in Biology I and reinforce the concepts learned there. Many of the illnesses that you will treat require that you have a working knowledge of bacteria, viruses, and animals. The chemistry, though sometimes difficult and tedious, is very important. There is an enormous amount of chemistry that goes along with medicine. Just think of all the different medicines that we have! How those medicines affect an organism is based solely on their chemical properties. So why should there be so much math? Each one of the career choices from above requires careful observation, deduction skills, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. After all, physics is nothing more than applied math. Each of these courses should give you an advantage as you start acquiring the skills necessary for pursuing one of these exciting careers. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
English III	___	___	___	___
Algebra II	___	___	___	___
Algebra III	___	___	___	___
Pre-calculus/Trigonometry*	___	___	___	___
Biology II	___	___	___	___
Chemistry	___	___	___	___
Physics	___	___	___	___
Phys Ed/Weights*	___	___	___	___
Phys Ed/Aerobics*	___	___	___	___
English IV	___	___	___	___

*Try to get through these classes before graduation. They really will help you out when you start Little Big Horn College.

Pre-Nursing and Pre-Medical Science Options

Pre-Nursing Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	English I	English II	English III	English IV
Math	Algebra I	Geometry	Algebra II	Precalculus Trigonometry
Science	Earth Science	Chemistry	Biology	Biology II
Electives			Phys Ed	Phys Ed

Pre-Medicinal Science Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	English I	English II	English III	English IV
Math	Algebra I	Geometry	Algebra II	Precalculus- Trigonometry
Science	Earth Science	Chemistry	Biology	Biology II
Electives	Phys Ed	Phys Ed	Physics	Algebra III

It is suggested that students achieve this minimal level in math and science.

Notes:

Student STEM Worksheet For Lodge Grass High School

Community Health

Pursuing a career in community health shows that you are concerned about the wellness of those in your community. With this type of degree you can teach those around you how to keep a healthy attitude, keep in shape, eat right, counsel, and rehabilitate. It is a very honorable career choice. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. In order to understand why some lifestyles are healthier than others it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Biology II will supplement the information you picked up in Biology I and reinforce the concepts learned there. Many of the illnesses that arise from a poor diet, an injury, unclean working conditions, or unplanned events can be prevented or treated by improving the quality of life and the resources that we use. The chemistry, though sometimes difficult and tedious, is very important. Chemistry will help you understand how a bad water supply, unclean air, a high fat diet, and numerous other circumstances can affect your community. So why should there be so much math? Each one of the career choices from above requires careful observation, deduction skills, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. Child development and physical education will supplement your knowledge base with information vital for community health. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
English III	___	___	___	___
Algebra II	___	___	___	___
Algebra III	___	___	___	___
Pre-calculus/Trigonometry*	___	___	___	___
Biology II	___	___	___	___
Chemistry	___	___	___	___
Child development	___	___	___	___
Phys Ed/Weights*	___	___	___	___
Phys Ed/Aerobics*	___	___	___	___
English IV	___	___	___	___

*Try to get through these classes before graduation. They really will help you out when you start Little Big Horn College.

Community Health Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	English I	English II	English III	English IV
Math	Algebra I	Geometry	Algebra II	Precalculus-Trigonometry
Science	Earth Science	Chemistry	Biology	Biology II
Electives	Phys Ed	Phys Ed	Child Development	Algebra III

It is suggested that students achieve this minimal level in math and science.

Notes:

Student STEM Worksheet For Lodge Grass High School

Natural Resources and Environmental Science

If you care about depleting or ruining the food and fuel we need, you may be interested in pursuing a career in Natural Resources and Environmental Science. Related fields include fish and wildlife management, environmental and health sciences, forestry, and resource conservation. In any of these careers you will be a scientist who checks and experiments on our natural resources. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to pursue any of these careers it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Biology II will supplement the information you picked up in Biology I and reinforce the concepts learned there as well as putting a strong emphasis on water quality and waste water management. The chemistry, though sometimes difficult and tedious, is very important. There is an enormous amount of chemistry that goes along with managing our resources. The pH of soil and water are great indicators of how healthy streams, forests, and fields are. Chemistry also plays a role in recycling, burning of fossil fuels, and mining of minerals. So why should there be so much math? Because every one of these careers will make you a scientist. Scientists require the ability to perform careful observation, utilize deduction skills, and most of all, the ability to calculate. You can think of managing resources as a math problem based on supply and demand. The importance is that the math skills you will acquire will aid you immensely as you pursue your college degree. The vocational agriculture classes are intended to give you a real working knowledge of how natural resources are used. This applies to raising cattle on grass or erosion of topsoil in a wheat field. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
English III	___	___	___	___
Algebra II	___	___	___	___
Algebra III	___	___	___	___
Pre-calculus/Trigonometry*	___	___	___	___
Biology II	___	___	___	___
Chemistry	___	___	___	___
Voc/Ag I	___	___	___	___
English IV	___	___	___	___
Voc/Ag II*	___	___	___	___
Voc/Ag III*	___	___	___	___

*Try to get through these classes before graduation. They really will help you out when you start Little Big Horn College.

Natural Resources/Environmental Science Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	English I	English II	English III	English IV
Math	Algebra I	Geometry	Algebra II	Precalculus-Trigonometry
Science	Earth Science	Chemnistry	Biology	Biology II
Electives	Voc Ag I	Voc Ag II	Voc Ag III	Algebra III

It is suggested that students achieve this minimal level in math and science.

Notes:

Student STEM Worksheet For Lodge Grass High School

General Sciences

Those with a sharp analytical mind tend to lean towards the general sciences. You can be a biologist, a chemist, a geohydrologist, a geologist, or a microbiologist. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to pursue any career in science it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Biology II will supplement the information you picked up in Biology I and reinforce the concepts learned there. The chemistry, though sometimes difficult and tedious, is very important. There is an enormous amount of chemistry that goes along with every science. So why should there be so much math? Biology is derived from chemistry and chemistry is derived from physics. Physics is applied math. As a scientist you will be required to utilize and develop the skills of careful observation, deduction, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. The math will also help you understand the study of physics. Each of these courses will aid you as you begin to acquire the skills necessary for pursuing one of these careers. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
English III	___	___	___	___
Algebra II	___	___	___	___
Algebra III	___	___	___	___
Pre-calculus/Trigonometry*	___	___	___	___
Biology II	___	___	___	___
Chemistry	___	___	___	___
Physics	___	___	___	___
English IV	___	___	___	___

*Try to get through these classes before graduation. They really will help you out when you start Little Big Horn College.

General Science Option

Subject	Freshman Year	Sophomore Year	Junior Year	Senior Year
English	ENG 9	ENG 10	ENG 11	ENG 12
Math	IM 1	IM 2	IM 4	IM 6
Science	Earth Science	Chemistry	Biology	Biology II
Electives				Physics

It is suggested that students achieve this minimal level in math and science.

Notes:

Programs of Study Technology Packet

Little Big Horn College

Associate of Arts in Computer Science

PROGRAM OF STUDY

IS 104	Spreadsheet	1	
IS 105	Database	1	
IS 220	Database Management	3	
IS 221	Numerical Analysis/Spreadsheets	3	
IS 250	Structured Business Programming	3	
IS 211	HTML and Web Page Design	3	
BU 221	Principles of Accounting I	3	
CP 254	Programming I	3	
CP 255	Programming II	3	
CP 256	Advanced Programming – Java, Oracle	3	
CP 257	Visual Basic Programming	3	
MA181	Calculus I	4	
	IS Course Option:	3	TOTAL CREDITS 33
	<i>IS 210 Desktop Publishing, IS 241 Computer Network Fundamentals</i>		
	<i>IS 240 Tech Troubleshooting, IS 260 Geographic Information Systems</i>		

CORE REQUIREMENTS

Communications - (9 credits must be completed)

CA 101	Composition I	3
CA 102	Advanced Writing	3
CA 203	Research Writing	3
CA 112	Public Speaking	3

Crow Studies - (6 credits must be completed)

CS 101	Crow Language I (Required)	3
CS 122	Crow Social Familial	3
CS 211	Thought and Philosophy	3

Science - (7 to 8 credits must be completed – one Life science and one Physical science)

SC 110	Principles of Biology/Lab	Life	3+1
SC 112	Biodiversity/Lab	Life	3+1
SC 121	Fundamentals of Gen Chemistry/Lab	Physical	3+1
SC 101	Mysteries of the Sky	Physical	3
SC 116	Physical World Around Us/Lab	Physical	3+1

Math - (4 credits must be completed)

MA150	Finite Math	4
MA165	Pre Calculus	4

Information Systems

IS 101-103	Introduction to Computers	3
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Humanities – (3 credits must be completed)

CA 106	Intro to Literature	3
CA 108	Literature of the American Indian	3
HU 101	Survey of Humanities	3

Social Science – (3 credits must be completed)

PY 101	General Psychology	3
SS 101	Introduction to Sociology	3
AN 111	Cultural Anthropology	3

TOTAL CREDITS 35

TWO YEAR PLAN OF STUDY**FALL – Year One**

IS 104 Spreadsheet	1
IS 105 Database	1
Core Requirements	15
	<hr/>
	17

FALL – Year Two

CP 255 Programming II	3
IS 211 HTML/Web Publish.	3
MA181 Calculus I	4
Core Requirements	<u>10</u>
	20

SPRING - Year One

IS 220 Database Programming	3
IS 250 Structured Bus. Program.	3
IS 221 Numerical Anal/Spreadsheet	3
CP 254 Programming I	3
Core Requirements	4
	<hr/>
	16

SPRING – Year Two

CP 257 Visual Basic Program.	3
CP 256 Advanced Program.	3
IS 220 Database Programming	3
Core Requirements	6
	<hr/>
	15

COURSE DESCRIPTION**IS 104 – Spreadsheet**

Introduces student to spreadsheet application software (Microsoft Excel or equivalent) and its use for solving numerical analysis problems and graphing.

IS 105 – Database

Introduces students to relational database management systems using Microsoft Access or other PC based software. Also covers use of Presentation Management software for use in preparing view-graphs and other visual aids for presentation.

IS 220 – Database Programming

Covers design and implementation of microcomputer databases using a relational database management system such as MS Access, Corel Paradox or Oracle. This course involves extensive hands-on use of the database software used and covers basic design of table structures, queries, reports, and forms, as well as data normalization concepts. Query design will include use of QBE (Query By Example) and SQL as well as introduction to macros.

Prerequisites: IS 101-105 (IS 104 and 105 may be taken concurrently)

IS 221 – Numerical Analysis/Spreadsheets

An advanced spreadsheet course covering numerical analysis using microcomputer spreadsheets. This course examines and applies spreadsheets to various common business and scientific related numerical analysis problems. Specific problems will deal with time and value of money; annuities budgeting, use of specialized financial functions, use of scientific functions, use of specialized data analysis tools in statistics, Internet data input, graphing, and macros.

Prerequisites: IS 101-104 (IS 104 may be taken concurrently), MA 105.

IS 250 – Structured Business Programming

An introductory course in the use of structured concepts/approaches for problem solving, programming and data presentation. Topics include the history of computer programming languages, program development procedures, logic and design tools to include flowcharts, structured flowcharts and pseudo code. Other areas of discussion are simple loops, counters and truth functional logic and decision tables. Students gain hands-on programming experience with a structured programming language such as Pascal, Visual Basic or C.

Prerequisites: IS 101-104 (IS 104 may be taken concurrently), MA 105 or consent of instructor.

IS 211 – HTML and Web Page Design

Introduces student to web page design fundamentals using “top down” approach. Emphasis is on understanding and application of sound design rules, use of white space, graphics, site maps, two-way data entry/retrieval, and links. Hands-on portion of the course begins with editor and Hypertext Markup Language (HTML), progresses to web design using Page development tools such as Publisher, Netscape Composer, and Microsoft Front Page. Also covered are aspects of web page/site publication and management.

Prerequisites: IS 101-103

BU 221 – Principles of Accounting I

An introduction to the principles of financial accounting for students of all business curricula. Specific topics include accounting concepts, recording transactions, worksheet and financial statement preparation, accounting systems, cash, receivables, inventory, long-term assets, liabilities, corporation, and analysis of financial statements.

CP 254 – Programming I

Implementation of structured programming designs in procedural language such as Pascal, Turbo Pascal or other 3rd generation high-level language. Emphasis on problem solving and algorithm development using the control structure abstractions of sequence, repetition, and selection. Other areas covered are structured program design, coding, debugging, testing and documentation as well as development of sound programming style.

Prerequisites: IS 101-103, CP 100

CP 255 – Programming II

Implementation of programming designs in a procedural language such as C or other high level 3rd generation language. Introduces advanced data types, abstract data types, queues, stacks, trees, sorting, data structure properties, problem solving and algorithm development in addition to use control structure abstractions of sequence, repetition, and selection.

Prerequisites: IS 101-103, CP 254

CP 256 – Advanced Programming – Java, Oracle

Application of programming techniques with object oriented language such as C++, Delphi, Java. Introduces classes and object manipulations in concert with standard control structures, data types, and elements used in procedural languages.

Prerequisites: (CP 254 may be taken concurrently with CP 256)

CP 257 – Visual Basic Programming

Introduces student to the Visual Basic programming language for microcomputers. Covers basics of sound structured program design, object based programming, logic data structures including single and multi-dimensional arrays, user interface design in a Visual (Windows) environment, Visual Basic naming conventions, procedure and function implementation.

Prerequisites: IS 250 or CP 100 (may be taken concurrently), MA 105

MA 181 – Calculus I

Topics in Calculus I include: functions, elementary transcendental functions, limits and continuity, differentiation, applications of the derivative, curve sketching, analytic geometry and integration.

Prerequisite: MA 165 or equivalent

IS 210 – Desktop Publishing/Computer Graphics

This course is designed to give the student an in-depth understanding of Desktop Publishing concepts and the computer software package Microsoft Publisher for Windows 9x. The student will become familiar with desktop publishing and advertising concepts such as proper page layout, target advertising, proper use of white space, proper use of scanned images proper use of graphics and integration of other software package outputs with Publisher. The course objectives will be accomplished through a hands-on “learning by doing” approach. The student will complete real world assignments such as Business Letterheads, Business Cards, Travel Brochures, Newsletters and other challenging assignments.

Prerequisites: IS 101 – 103 (IS 103 may be taken concurrently)

IS 241 – Computer Network Fundamentals

Covers topics on multi-user operating systems with emphasis on computer local area networks (LAN). Emphasis is placed on LAN architectures, network administration tools, communication protocols, elements of networks and network administration considerations.

Prerequisites: IS 101 – 104

IS 240 – Tech Troubleshooting**IS 260 – Geographic Information Systems**

Introduction to PC based geographical information systems including aspects of mapping, GIS databases, coordinate systems, scaling, and resolution, 3D to 2D conversions, data collection, and information retrieval. Students gain hands-on experience with PC based GIS systems such as MapInfo, ScanUS, ArcView. This course will also cover application and use GIS concepts in business, cultural and scientific applications and is intended to fulfill one of the optional elective courses in IS.

Prerequisites: IS 101-105 (IS 104 and 105 may be taken concurrently), MA 105

LODGE GRASS HIGH SCHOOL

GRADUATION REQUIREMENTS (22 Credits to Graduate)

English	4 credits
Math	3 credits
Science	2 credits
Physical Education	1 credit
Social Studies	3 credits
Electives	9 credits

PLAN OF STUDY

	<u>Required</u>	<u>Elective</u>	<u>Credits</u>	<u>Recommended Elective Courses for Computer Science at LBHC</u>
Freshman:				
English I	√		1	
Earth Science			1	
P.E./Health I	√		1	
Algebra I				
Keyboarding				
Electives		√		
<i>Total Credits – Freshman Year</i>			5	
Sophomore:				
English II	√		1	
Biology I	√		1	
P.E./Health II	√		1	
Algebra II				
World History				
Plan Geometry				
Electives		√		
<i>Total Credits – Sophomore Year</i>			5	
Junior:				
English III	√		1	
U.S. History	√		1	
Algebra II				
Plan Geometry				
Trigonometry				
Physics				
Biology II				
Chemistry				
Electives		√		
<i>Total Credits – Junior Year</i>			5	
Senior:				
English IV	√		1	
PAD	√		1	
Electives		√		
<i>Total Credits – Senior Year</i>			<u>5</u>	
TOTAL CREDITS			22	

JUNIOR YEAR:		<i>Lodge Grass High School</i>		
			Required	Recommended
	English III		X	
	U.S. History		X	
	Advanced Word Processing			X
	Computer Information Systems I			X
	Algebra III			X
	Chemistry			X

SENIOR YEAR:		<i>Lodge Grass High School</i>		
			Required	Recommended
	English III		X	
	U.S. History		X	
	Computer Information Systems II			X
	Pre-Calculus w/ Trigonometry			X
	Biology			X

COURSE DESCRIPTION

Recommended Elective Courses for Major Course of Study in Computer Science at Little Big Horn College

Advanced Word Processing

This course teaches advanced word processing skills where the student learns to efficiently use features to produce high-quality business documents. Students will also learn the correct ways to use a mouse, menu bar, toolbars, property bar, commands dialog box options & quick menus contained in a windows operating environment. Among the skills developed are those for using text enhancements, formatting & editing documents, working with multiple-page documents, macros and templates, columns, tables, calculations and sort, mail merge, desktop publishing, graphics, file management and customizing toolbars, and integrating the word processing software with the Internet and web pages.

This course builds upon skills previously acquired in document processing in the first year in order to refine and prepare students for entry-level office positions. This software used in this course will be either WordPerfect Suite 8 or Microsoft Office Word 2000.

Students taking this course will become familiar with using processing software in a windows environment. Students will create, revise, and print complex business documents. They will demonstrate decision-making and critical thinking skills in the selection of a combination of efficient features to handle a particular task. They will also use all advanced features to improve word processing efficiency and enhance file manipulation.

Prerequisite: One year of Document Processing – Grades 10-12)

Computer Information Systems 2000 – Level 1

This course will contain an overview of computer concepts, computer, software applications using integrated software, input into the computer, output from the computer including a variety of output devices, scanner, multimedia, etc., secondary storage, security, ethics, and privacy of software, e-mail and Internet use. This course will provide students with an opportunity to create real applications using Microsoft Office 2000. Students will receive hands-on instruction with essential business machines and microcomputers. The student will learn the following software: Word 2000, Access 2000, Excel 2000, and PowerPoint 2000. Microsoft Office 2000 contains a suite of programs that may be used independently or together to create complex documents. Many jobs in today's workplace require knowledge of this best-selling software suite.

Prerequisite: One year of Document Processing

Computer Information Systems 2000 – Level 2

This course will use Microsoft Office 2000 integrated software for more sophisticated hands-on projects and learning. More emphases will be placed on multimedia tools, as well as Internet usage and web page design.

Prerequisite: One year of Document Processing & One year of Computer Information Systems 2000 – Level 1)

Pre-Calculus with Trigonometry

PRE-CALCULUS is a course specifically designed to prepare students for calculus and other courses in discrete mathematics. Graphing calculators will be used extensively to encourage students to build an intuitive understanding of the concepts.

Algebra III

Algebra III is an expansion and extension of concepts and math skills introduced and developed in Algebra I and Algebra II. It is a necessary and prerequisite course to succeed in any higher subsequent.

Prerequisite: Algebra II

Biology II

Introduces concepts from Chemistry and Microbiology applicable to the study of the human body. Units on the following will be included: Anatomy and Physiology of each body system, disease, and the disease process.

Prerequisite: Biology I

Chemistry

Students enrolling in Chemistry will be presented with an up-to-date approach to introductory Chemistry. Chemical concepts and principals are developed in a logical yet flexible order to make the study of Chemistry interesting and challenging for students. Many features have been included to strengthen the presentation with intent of increasing students understanding and interest in Chemistry.

Prerequisite: "C" or better in Biology I & Algebra I

Program of Study Engineering Packet

Little Big Horn College does not offer a pre-engineering program of study. If a student is interested in pursuing a career in engineering it is suggested that the student follow the general science worksheet on page 24 of this booklet, then transfer to Montana State University-Bozeman.

Programs of Study Math Packet

Listed below are the individual programs of study offered at Little Big Horn College that have been cross-referenced to several four year degrees. If the student's math career of choice is not listed below, feel free to contact a consultant to discuss a proper plan of study.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts in Mathematics	Mathematics Mathematics Education	MSU-Bozeman MSU-Billings Rocky U of Montana

ASSOCIATE OF ARTS IN MATHEMATICS

The Mathematics program of study is designed to prepare a student for entry-level studies in math, science, computer science, engineering and teaching mathematics at the secondary level. The courses are parallel to meet the needs of the student who will transfer to a four-year degree program.

Program of Study

CP 254	Programming I	3
CP 255	Programming II	3
IS 104	Spread Sheet	1
IS 105	Dbase	1
IS 250	Structured Bus.Prog.	4
MA 181	Calculus I	4
MA 182	Calculus II	4
MA 213	Elementary Stats	3
SC 131/135	Adv. Gen. Chem I/Lab	4
SC 132/136	Adv. Gen. Chem II/Lab	4
Total Program Credits		30

35 CORE Requirements + 30 Program of Study = 65

TWO-YEAR PLAN OF STUDY: MATHEMATICS

<u>Fall</u>	<u>Year 1</u>		<u>Spring</u>	<u>Year 1</u>	
IS 104	Spread Sheets	1	IS 250	Structured Bus. Prog.	3
IS 105	D Base	1	CP 254	Programming I	3
SC 131/135	AdvGenChem/Lab I	4	SC 132/136	AdvGenChem/Lab II	4
CORE Requirements		11	MA 216	Elem. Stats	3
			CORE Requirements		3
<u>Fall</u>	<u>Year 2</u>		<u>Spring</u>	<u>Year 2</u>	
CP 255	Programming II	3	MA 182	Calculus II	4
MA 181	Calculus I	4	CORE Requirements		11
CORE Requirements		10			

Lodge Grass High School Suggested Plan of Study

The following courses are suggested for a smooth transition from Lodge Grass High School into the Little Big Horn College math curriculum. The classes that apply for the associate of arts in mathematics at LBHC are listed below. Other classes that are listed are required for graduation and/or are a part of the college preparation program at Lodge Grass High School.

For all Associates of Arts in Mathematics

<u>Freshman</u>	<u>Sophomore</u>
English I	English II
P.E. /Health I	P.E./Health II
Earth Science	Biology
Keyboarding	World History
Algebra I	Geometry
<u>Junior</u>	<u>Senior</u>
English III	English IV
U.S. History	PAD
Algebra II	Pre-Calculus with Trigonometry

To fulfill a college preparatory curriculum, the student should take two years of electives selected from the following:

- Foreign Language
- Computer Science
- Visual and Performing Arts
- Vocational Education units which meet the Office of Public Instruction guidelines.

Suggested Electives:

Physics is suggested for students interested in any general science or engineering science related career.

Chemistry is recommended for any student entering into a biological or chemical engineering field.

Computer Information Systems 2000 Levels 1 & 2 are recommended for any student interested in entering into a programming career.

Little Big Horn College Math Course Descriptions**MATH 061 Basic Mathematics 3 credits FS**

This class covers the basic mathematical concepts of addition, subtraction, multiplication and division of fractions. Decimals, percents, proportions, conversions and rounding will be covered. This course is designed to prepare students for business math and elementary algebra.

Prerequisite: Math placement test, scores less than 10 correct on the ASSEST test.

Non-transferable.

MATH 071 Pre-Algebra 4 credits FS

This course is designed to teach students the fundamental mathematical concepts needed to be successful in college level mathematics courses. Topics covered include: a review of basic operations of arithmetic, with emphasis of properties basic to algebra, integers, and rational expressions – multiplying, dividing, adding, subtracting and factoring. Also covered are exponents, and linear equations, inequalities and graphing, polynomials and rational expressions will also be covered.

Prerequisite: MATH 061 or math placement test, scores between 11 and 17 on the ASSEST test.

Non-transferable.

MATH 081 Algebra 4 credits FS

This class covers the topics of graphs of linear equations and inequalities, systems of linear equations, and square roots, properties of real numbers; linear equations and inequalities in one variable, graphing linear equations and inequalities, systems of linear equations and inequalities in two or three variables; exponents, roots and radicals; polynomials and algebraic functions; quadratic equations and inequalities in one variable and graphing quadratic equations and inequalities.

Prerequisite: MATH 071 or math placement test, scores between 18 and 25 on the ASSEST test.

Non-transferable.

MATH 105 Algebra for College Students 4 credits FS

This class covers the topics of functions and their graphs, including polynomial and rational functions, radical functions, exponential and logarithmic functions. Absolute value equations and inequalities, compound inequalities; complex numbers; systems of

second degree equations and inequalities; conic sections, matrices and determinants. Mathematical induction and the Binomial Theorem are included.

Prerequisite: MATH 081 or math placement test, score of 26 or more on the ASSEST test.

Transferable.

MATH 150 Finite Math 4 credits FS

Finite Math is a course that covers topics with applications to the natural science, social sciences, and liberal arts. The topics covered in this class include: basic math skills and cultural implications of topics in mathematics, including number systems, geometric, algebraic, financial and trigonometric models; measurement; probability and descriptive statistics; and calculus. This course introduces students to areas of interest in applied and pure mathematics. Intended for students wishing to satisfy the general education mathematics requirement.

Prerequisite: MATH 105 or math placement test, score of 26 or more on the ASSEST test.

Transferable.

MATH 165 Pre-Calculus 4 credits FS

The topics covered in this class include functions, graphs, and the use of symbols for expressing mathematical thoughts, polynomials, rational, exponential, logarithmic, and trigonometric functions. Required only of students who want to take MATH 181 and whose placement test shows a need for further study of this material.

Prerequisite: Successful completion of MATH 105 or equivalent.

Transferable.

MATH 181 Calculus I 4 credits F(alternate years, 2001)

Topics in Calculus I include: functions, elementary transcendental functions, limits and continuity, differentiation, applications of the derivative, curve sketching, analytic geometry and integration.

Prerequisite: Successful completion of MATH 165 or equivalent.

Transferable.

MATH 182 Calculus II 4 credits S(alternate years, 2002)

This class includes: methods of integration, applications of the integral, first order differential equations, Taylor polynomial and series.

Prerequisite: Successful completion of MATH 181.

Transferable.

MATH 216 **Elementary Statistics** **3 credits** **S**
Conventional notation and equations are used to explain traditional and robust estimates of location; and variability, fundamentals of probability theory, confidence intervals and test of hypothesis for normal distributions.
Prerequisite: Successful completion of MATH 105.
Transferable.

Student STEM Worksheet for Lodge Grass High School

Mathematics

The following worksheet is to help you plan your high school studies to ensure the best possible transition to the college level of studies to pursue a career in mathematics. Math degrees can allow for careers in fields such as science, physics, statistics, education, and engineering. First of all, following the given plan of study for Lodge Grass High School will allow the best advantage for entering into college. This will provide a solid background for pursuing your college degree. Suggested electives to be taken include chemistry and computer applications. Chemistry is a science class involving a large magnitude of mathematics to understand chemical, physical, and biological changes in our world. Computers are involved with many careers today. Gaining as much knowledge about them is a tremendous advantage to you. Computers are used in a variety of ways including: analyzing data, gaining statistics, preparing reports and communicating with other colleagues. Programming is another career that uses a large amount of math. Each of the courses listed in the program of study will be beneficial and will give you an advantage when pursuing your college degree.

The following checklist is in accordance with the plan of study given previously. Place a check in the appropriate space below to keep track of the courses you should take before or during your junior and senior years.

Course	Successful Completion
English III	_____
English IV	_____
Algebra II	_____
Trigonometry/Pre-Calculus/Calculus	_____
Chemistry	_____
Computer Applications I	_____
Computer Applications II	_____
World History	_____
American History	_____
American Government	_____

STEM Science, Technology, Engineering and Math Packet
2000-2001

CROW INDIAN STEM PROJECT
Funded by the American Indian Science and Technology Education
Consortium

Prepared for Plenty Coups High School

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STEM Science and Engineering Packet

2000-2001

CROW INDIAN STEM PROJECT

Funded by the American Indian Science and Technology Education Consortium

Purpose

The purpose of the Crow Indian STEM (Science, Technology, Engineering, and Math) Project is to aid students in preparing for a career in science, technology, engineering, or math. This system utilizes “two plus two plus two” agreements between Crow Reservation high schools, Little Big Horn College, and the four-year universities in Montana. These agreements have been designed to help prepare high school students for college through careful selection of coursework for science and technology based careers.

Consultants from Little Big Horn College have examined course descriptions and objectives offered by your high school and have derived suggested plans of study for students interested in science, technology, engineering, or math to be taken during the students’ junior and senior years (the first “two”). The goal is to help students make the transition from high school to Little Big Horn College in the disciplines of math and science; that is to bring down the boundaries between high school and college level math and science.

The next portion of the agreement (the second “two”) is between the faculty of Little Big Horn College and the students. Upon matriculation into LBHC, the students will follow a suggested plan of study developed as appropriate, relevant, and transferable to a four-year institution that offers a career based four-year degree. This gives the students’ the advantage of attending a college within their community while preparing them for transfer to a four-year institution.

The final “two” in this agreement is between Little Big Horn College and the Montana University System. After leaving Little Big Horn College with an associates degree, your students will spend two years at a four-year university completing their degree. The consultants from LBHC have ensured that all suggested courses are transferable from LBHC to the Montana University System.

As an example, suppose a student tells his or her high school instructor or counselor that he or she has an interest in medicine. The instructor or counselor will consult the STEM packet designed for that high school, and note that a suggested plan of study includes: mathematics through trigonometry and pre-calculus, two years of biology, one year of chemistry, one year of physics, advanced composition, and information systems. The student can then choose those courses during registration. If the student has taken the suggested courses during junior and senior years, he or she should have a smoother transition into LBHC and a greater chance of succeeding the community health curriculum. The following two years at LBHC will be spent studying chemistry, biology, calculus, research writing, physics, and anatomy and physiology. This time will be used to hone the student's academic skills and prepare the student for transfer to MSU-Billings, MSU-Bozeman, Rocky Mountain College, or the University of Montana. Once the student has transferred from LBHC to one of these institutions, he or she will finish their four-year degree during the final two years of STEM and apply to medical school during their junior year of college.

In summary, the STEM project has been designed with a "two plus two plus two" agreement. The first two years were designed to prepare students for college. The second two years are spent at LBHC earning credit towards a four-year degree. The final two years are spent at one of the four-year universities in Montana.

Purpose of STEM

1. To help students prepare for college as soon as their junior year of high school.
2. To create a seamless transition from high school math and science to college level math and science.
3. To develop a career based plan of study to guide students from high school through completion of bachelor's degrees.
4. To train Crow students in science, technology, and math based careers, giving the students ownership of that knowledge, leading to increased opportunity on and off the Crow Indian Reservation.

Why STEM is Necessary

1. Technology, engineering, and science are all math based.
2. 40% of all career opportunities are math or science based.
3. Students spend an average of 3.7 years at Little Big Horn College pursuing a two-year degree.
4. One quarter to one third of all courses at Little Big Horn College are taught on a developmental level.
5. We want to set students on their way towards a career so they do not waste their precious time and financial aid on excess years at LBHC.

Why We Need Your Help

1. 65% of all Crow high school students from Lodge Grass, Plenty Coups, St. Labre, and Hardin attend Little Big Horn College after high school.
2. College level courses are at least a year away from almost all LBHC entering freshmen.
3. Students choose their high school courses based on lack of information, ease, or to “float” to graduation.
4. We want to influence students into taking gateway courses that will open opportunity to our Crow students.

Working with you, we have developed a suggested plan of study that informs students which courses they should take in preparation for matriculation at Little Big Horn College with a specific career in mind. This plan of study consists of a packet that has been custom designed for your high school and specific career goals. The individual packets have been arranged according to Science, Technology, Engineering, or Math. This enables students to enter LBHC better prepared for a specific career or field. At LBHC we will prepare the students for a four-year university while teaching the freshman and sophomore curricula. The final phase is completion of a STEM based four-year degree.

Contacts

Below is a list of contacts at Little Big Horn College. Please feel free to call or email us regarding any questions.

Collena Caplett , STEM coordinator	638-3181	<u>caplett@looksmart.com</u>
Willis Tsosie , Technology consultant	638-3133	<u>wtsosie@main.lbhc.cc.mt.us</u>
Maxine Hamburg , Technology consultant	638-3130	<u>maxine@main.lbhc.cc.mt.us</u>
Jana Brockie , Math consultant	665-1908	<u>jfh2os@yahoo.com</u>
Kris Cunningham , Science and Engineering consultant	638-3136	<u>kris@main.lbhc.cc.mt.us</u>

Programs of Study

On the following pages are the individual programs of study for science offered at Little Big Horn College. Each section starts with a series of options that students may choose from at each Montana university. A course outline of the appropriate program of study is listed in the next section. This is followed by a suggested plan of study for preparing high school students for matriculation into LBHC.

Which Program Do I Choose?

Listed below are the individual programs of study offered at Little Big Horn College that have been cross referenced to several four year degrees. If the student's science career of choice is not listed below, feel free to contact the consultant to discuss a proper plan of study.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts	Nursing	MSU-Bozeman
Pre-nursing option	Pre-Physical Therapy*	MSU-Billings MSU-Bozeman Rocky
	Pre-Medicine and Pre-Medical Science*°	MSU-Billings MSU-Bozeman Rocky U of Montana
	Pharmacy*	U of Montana
	Physical Therapy*°	U of Montana

*Denotes that the SC 131/135 & SC 132/136 Advanced Chemistry I & II should be taken instead of SC 121/125 & SC 122/126 Intro to Gen Chem & Intro to Biochem.

°It is suggested that students interested in these classes also complete MA 181 & MA 182 Calculus I & II prior to matriculation into a four year college.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts Community Health	Community Health*	MSU-Bozeman
	Dietetics*	MSU-Bozeman
	Health Enhancement* Teaching	MSU-Bozeman
	Human Services	MSU-Billings
	Rehabilitation and Related Services	MSU-Billings

*Denotes SC 121/125 & SC 122/126 Intro to Gen Chem & Intro Biochem are required for degree

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts Natural Resources/ Environmental Science	Fish and Wildlife Management	MSU-Bozeman U of Montana
	Environmental* Health/Science	MSU-Bozeman Rocky U of Montana
	Microbiology*	MSU-Bozeman
	Forestry	U of Montana
	Resource Conservation	U of Montana

*Denotes that SC 131/135 & SC 132/136 Advanced General Chemistry I & II are required for these degrees.

<u>LBHC Program of Study</u>	<u>Four Year Degree</u>	<u>Offered At</u>
Associate of Arts General Science	Biology*°	MSU-Billings MSU-Bozeman Rocky U of Montana
	Chemistry*°	MSU-Billings MSU-Bozeman Rocky U of Montana
	Geohydrology*°	MSU-Bozeman

LBHC Program of Study

Associate of Arts
General Science

Four Year Degree

Geology*°

Offered At

Rocky
U of Montana

*Denotes that SC 131/135 & SC 132/136 Advanced General Chemistry I & II are required for these degrees.

°Denotes that MA 182 Calculus II is required for these degrees.

Little Big Horn College Programs Of Study

ASSOCIATE OF ARTS IN SCIENCE: PRE-NURSING OPTION

This program of study is for those students who are pursuing a degree as a Registered Nurse and wish to earn an Associate of Arts Degree prior to receiving a two-year or four-year degree at another institution. Fulfilling LBHC requirements will allow a student to acquire many of the courses offered in two-year RN programs, or prepare for transfer to a four-year institution at the junior level.

To earn a degree in Science: Pre Nursing Option, a student must complete the core Requirements as well as the courses listed below:

Program of Study

PY 201	Lifespan Development	3
SC 212/213	Microbiology and Disease/Lab	4
SC 210	Anatomy and Physiology/Lab	4
SC 211	Anatomy and physiology/Lab	4
SC 214	Nutrition	3
SC 122/126	Intro to Biochemistry/Lab	4
SS 101	Sociology	3
Total Program Credits		25

35 Credits CORE + Program of Study 25 = 60 Credits

TWO YEAR PLAN OF STUDY: PRE-NURSING OPTION

Fall Year 1

SC 121/125	Intro to Gen Chem	4
SC 110	Principles of Bio/Lab	4
CORE Requirements		9

Fall Year 2

SC 210	Anatomy & Phys.	4
CORE Requirements		9

Spring Year 1

SC 122/126	Intro to BioChem/Lab	4
PY 201	Lifespan Develop	3
CORE Requirements		9

Spring Year 2

SC 211	Anatomy & Phys.	4
SC 212/213	Micro & Disease	4
SS 101	Sociology	3
SC 214	Nutrition	3

ASSOCIATE OF ARTS DEGREE IN SCIENCE: COMMUNITY HEALTH

This program of study is concerned with improving health and well-being for the promotion of healthful lifestyles, community actions for health, and conditions that make it possible to live healthy lives. Students can transfer to a four-year institution to complete this degree that will prepare them for entry level employment related to community health.

Program of Study

HE 201	Wellness	3
HS 111	Chemical Dependency	3
SC 210	Anatomy and Physiology I	4
SC 211	Anatomy and Physiology II	4
SC 212/213	Microbiology & Disease/Lab	4
SC 214	Nutrition	3
SC 244/245	Environmental Science/Lab	4

Total Program Credits 25

35 Credits CORE + 25 Program of Study = 60 credits

TWO YEAR PLAN OF STUDY: COMMUNITY HEALTH

Fall Year 1

HS 111	Chemical Dependency	3
Core Requirements		11

Spring Year 1

HE 201	Wellness	3
SC 244/245	Environ.Sci	4
Core Requirements		9

Fall Year 2

SC 210	Anatomy & Phys. I	4
CORE Requirements		9

Spring Year 2

SC 211	Anatomy & Phys. II	4
SC 212/213	Micro/Lab	4
SC 214	Nutrition	3
CORE Requirements		6

ASSOCIATE OF ARTS DEGREE IN : NATURAL RESOURCES/ENVIRONMENTAL SCIENCE

Natural Resource Management is a broad field where professionals work to preserve, conserve and manage natural resources. Careers may be in fish & wildlife, forestry, range management, agriculture, national parks, or many other areas. Environmental science careers focus on environmental protection and rehabilitation from harmful human impacts, such as overgrazing, mining and pollution. Careers may be in environmental science, land or water resources, reclamation, or many other areas.

Program of Study

SC 102 Ecology+Lab	4
SC 112 Biodiversity	4
One of the following:	
SC 122 Intro to Biochemistry	4
SC 132 Adv.Gen Chem II	4
SC 244 Environmental Science+Lab	4
MA 216 Elementary Statistics	3
Additional credits (as listed here)	7-8

Natural Resource majors take two

SC 203 Rangeland Resources/Lab	4
SC 202 Identification Seed Plants	4
SC 205 Soils	4
IS 260 GIS/GPS	3
SC 276 Internship	4

Environmental Science majors take two

SC 104 Geology + Lab	4
SC 202 Identification of Seed Plants	4
SC 205 Soils	4
IS 260 GIS/GPS	3
SC 276 Internship	4

Total Credits: 26-27

Also recommended: IS104/105 Intro to Computers, BU220 Economic Way of Thinking
35 core Requirements + 26-27 Program of Study = 61-62

TWO YEAR PLAN OF STUDY: NATURAL RESOURCES/ENVIR. SCIENCE

* Denotes Core classes that MUST be taken for this major.

Students pursuing natural resources careers usually take the SC121 chemistry sequence; those interested in environmental science careers take the SC131 chemistry sequence. Freshmen should complete writing and information systems requirements in year one.

Fall Year 1

*SC 110 Principles of Biology + Lab	4
Core requirements	12

Spring Year 1

SC 112 Biodiversity + Lab	4
*MA 165 Pre Calculus	4
Science elective	3-4
Core requirements	6

Fall Year 2

*SC121 or SC131	4
SC 102 Ecology	4
Science elective	3-4
Core requirement	3

Spring Year 2

SC 244 Environmental Sci.	4
SC 122 or 132 Chemistry	4
MA 216 Statistics	3
Core requirement	3

ASSOCIATE OF ARTS IN SCIENCE: GENERAL SCIENCE OPTION

The General Science Option is designed for the student planning transfer to a four-year college in science. This option provides a solid background in a variety of science fields including pre-professional health careers and secondary science education. The student will be assigned an advisor from the science faculty depending on the student's area of interest.

Program of Study

*MA 181	Calculus I	4
MA 216	Elem Statistics	3
**SC 121/125	Intro to Gen Chem/Lab	4
SC 122/126	Intro to Biochemistry/Lab	4
Or		
**SC 131/135	Adv. Gen. Chemistry/Lab I	4
SC 132/136	Adv. Gen Chemistry/Lab II	4

Choose four (4) of the following courses for 12-14 credits

SC 102/103	Ecology/Lab	4
SC 110/111	Principles of Biology/Lab	4
SC 112/113	Biodiversity/Lab	4
SC 210	Anatomy & Physiology I	5
SC 211	Anatomy & Physiology II	5
SC 213/213	Micro & Disease/Lab	4
SC 244/245	Environmental Science/Lab	4

*Fulfills group requirement for math

**Fulfills group requirement for science

35 CORE Credits + 23-25 Program of Study Credits = 58-60

TWO YEAR PLAN OF STUDY: GENERAL SCIENCE OPTION

Fall Year 1

SC	Chemistry Sequence	4
MA 181	Calculus I	4
Core Requirements		9

Spring Year 1

SC	Chemistry Sequence	4
MA 216	Elem. Statistics	3
Core Requirements		9

Fall Year 2

SC	Science Elective	4
SC	Science Elective	4
Core Requirements		6

Spring Year 2

SC	Science Elective	4
SC	Science Elective	4
Core Requirements		3

Plenty Coups High School Suggested Plan Of Study

The following courses are suggested for a smooth transition from Plenty Coups High School into the Little Big Horn College science curriculum. These are not requirements; these are suggestions.

For all Associates of Arts in Science Options:

Junior Year

English III
Algebra II, Algebra III
Chemistry

Senior Year

English IV
Trigonometry/Calculus
Advance Biology

For Pre-Nursing Option:

Biology II is suggested for students interested in a pre-physical therapy, pre-medicine, and pre-medicinal science. Advanced physical education is also suggested for these students.

For Community Health Option:

Child development is suggested as well as physical education.

For Natural Resources/Environmental Science Option:

Biology II is very strongly recommended for students interested in any degree related to this option.

For General Science Option:

Criteria from above.

Little Big Horn College Science Course Descriptions

SC 050 Survival Chemistry

1 cr F

Basic fundamentals of chemistry as it applies to biology. Recommended for students with no previous chemistry, or who would like a brief review of chemistry, and who are taking or will be taking SC111, SC112, SC113, SC 242 or SC244. Open to any student. There are fifteen class periods for the first four weeks of the quarter.

SC 101 Mysteries of the Sky

3 cr F/S*

A non-mathematical survey of the Universe, from our planet Earth, our neighboring planets and the sun, outward to the constellations, our galaxy and the Universe beyond. Includes sun spots, comets, black holes, quasars and cosmology. Recent discoveries will be presented. Students will learn how to handle a telescope and one mandatory night laboratory is included.

SC 102 Ecology**3 cr F (2001)**

Students will develop an understanding of how the natural world works by studying the relationships among plants, animals and other living things and between living things and their environments. The course will explore how species evolve, and the composition, function and distribution of populations, communities and ecosystems. It is recommended that students without a high school chemistry background enroll in SC 050 Survival Chemistry prior to enrolling in SC 102.

SC 103 Ecology Lab**1 cr F (2001)**

Ecology Lab accompanying SC 102 Ecology.

SC 104 Introduction to Geology**3 cr S**

This course covers minerals, rocks, geologic time, heat, volcanism, earthquakes, magnetism, gravity and mountain building processes as related to plate tectonics and land forms. Weathering, glaciers, rivers, oceans and beaches are introduced.

SC 105 Introduction To Geology Lab**1 cr S**

Laboratory to accompany SC 104. Includes field trips.

SC 110 Principles of Biology**3 cr F**

This course addresses biological principles common to living things. The course content includes cell structure, function, metabolism and reproduction. Energy pathways, basic genetics, evolution, classification, diversity and ecology are included in the course. The lab is a required co-requisite. Student who do not have a chemistry background are strongly advised to enroll in SC 050 Survival Chemistry.

SC 111 Principles of Biology Lab**1 cr F**

Laboratory to accompany SC 110. Includes laboratory experiments related to course work in SC 110 Principles of Biology.

SC 112 Biodiversity**3 cr S**

Biodiversity is an overview of the diversity of life, examining bacteria, protists, fungi, plants and animals, with an emphasis on animals and vascular plants. Classification, survival strategies, reproduction ecological importance and comparison of biological systems are a part of the course content. The lab is a required co-requisite.

SC 113 Biodiversity Lab**1 cr S**

The Biodiversity lab includes laboratory experiments related to course work in SC 112 Biodiversity.

SC 116 Physical World Around Us**3 cr F/S**

This course is intended for education majors and non science majors. This course introduces students to the fundamentals of chemistry, physics, and earth science and their roles in our understanding of the world. This course explores the impacts of each on our society.

SC 117 Physical World Lab**1 cr F/S***

Lab that corresponds with SC 116

SC 121 Introduction to General Chemistry**3 cr F (2000)**

This is an introductory chemistry course designed for pre-nursing students and students lacking a strong background in chemistry. This course will cover general chemistry including: atomic structure, periodicity, chemical bonding, chemical reactions, acid-base systems, thermodynamics, and the behavior of gasses, liquids, solids, and solutions. This course will also cover selected topics in organic chemistry including: nomenclature, functional groups, organic synthesis, and the structure and role of organic molecules.

SC 122 Introduction to Biochemistry**3 cr S (2001)**

This course is the second half of the introductory chemistry for pre-nursing students and non-science majors. This course will cover functional groups of organic molecules and discuss their role in the synthesis of biomolecules. Other topics included are: the role of biological molecules such as carbohydrates, lipids, proteins, nucleic acids, and metabolic processes and cellular structure.

SC 125 Introduction to General Chemistry Lab**1 cr F (2000)**

Lab that corresponds with SC 121

SC 126 Biochemistry Lab**1 cr S (2001)**

Lab that corresponds with SC 122

SC 131 Advanced General Chemistry I**3 cr F (2001)**

This course introduces students to the fundamental concepts of chemistry. This includes atomic structure, stoichiometry, chemical bonding, and laws governing the relationships of elements and compounds.

SC 132 Advanced General Chemistry II**3 cr S (2002)**

This course is a continuation of SC 131. It covers solubility, equilibria, entropy, free energy, electrochemistry and inorganic descriptive chemistry.

SC 135 Advanced General Chemistry I Lab**1 cr F (2001)**

Lab that corresponds with SC 131

SC 136 Advanced General Chemistry II Lab**1 cr S (2002)**

Lab that corresponds with SC 132

SC 202 Seed Plants**3 cr F (2002)**

The course will introduce the student to tress, shrubs and herbaceous flowering plants in the local area. The student will collect and prepare plant specimens. Vocabulary, classification, nomenclature and the use of manuals (plant “keys”) will be a part of the course material. Half of course time will be devoted to lab and field exercises.

SC 203 Range Land Resources**3 cr F (2002)**

This course describes the world’s range lands as related to their historic, present and potential use. The course will include Plains grasslands. Special attention will be given to how range land uses affect the nutrient, biological and hydrological cycles around the world and how the ecosystems respond to change. Concepts related to ecological conditions, land potential and ecological trends are introduced in the course material.

SC 204 Range Land Resources Lab**1 cr F (2002)**

Lab accompanying SC 203 Range Land Resources

SC 205 Soils**3 cr S**

The Soils course acquaints the student with soil properties the components of ecosystems and landscapes. How knowledge of soils is applied to the management of agricultural, wildland and urban landscapes is a major part of the course work. The student will be made aware of the problems related to environmental science.

SC 210 Anatomy & Physiology I**4 cr F**

This course is the first in the A&P sequence. SC 110, Principles of Biology is a prerequisite. In this course the student will examine cellular structure, the integumentary system, the muscular system, the skeletal system, and nervous system, and the endocrine system if time allows. Lecture is three times per week focusing on physiology. One period per week is reserved for discussions related to anatomy. Field trips and lab experience incorporated into coursework.

SC 211 Anatomy & Physiology II**4 cr S**

This course is a continuation of SC 210. In this course the student will examine the endocrine, blood and lymph, cardiovascular, respiratory, urinary, digestive and reproductive systems. Lecture is three times per week focusing on physiology. One period per week is reserved for discussions related to anatomy. Field trips and lab experience incorporated into coursework.

SC 212 Microbes & Disease**3 cr S**

The prerequisite for this course is SC 110 Principles of Biology, as knowledge of cells is essential to the study of microbes. The course begins with a general history of microbiology and microscopes. An overview of the anatomy and physiology of bacteria, viruses, protozoan, and fungi is part of the course content. The remainder of the course is devoted to studying organ/organ system diseases, and the type of microbes that cause

them. Also included are concepts of immunity, and general laboratory procedures. Upon completing the course, the student should have a general knowledge of disease causing antigens, and how these organisms are handled in a lab setting.

SC 213 Microbes & Disease Lab

1 cr S

Lab accompanying SC 212

SC 214 Nutrition

3 cr S (2002)

This course covers the basic concepts of human nutrition as related to health and food consumption at the different stages of the life cycle. In addition, nutritional assessment and dietary modifications used in health and disease are also studied.

Prerequisites: SC110; SC 121 or 131

SC 244 Environmental Science

3 cr S

Environmental Science acquaints the student with the relationship between people and the environment and how human activities affect the earth's natural ecosystems. The course addresses environmental issues such as range and farmland practices, soil ecology, pests and pesticides and alternative methods of pest control, the water cycle and water pollution, air quality and air pollution, hazardous and solid waste management. The student will learn ways to reduce and prevent pollution, population management, protection of wild species, and how to sustain the earth's natural ecosystem upon which life depends.

SC 245 Environmental Science Lab

1 cr S

Laboratory experience accompanying Environmental Science

SC 276 Science Internship

OD

Provides student with the opportunity to apply theoretical knowledge in a work placement experience. Academic Advisor will assist student with work place placement and development of course objectives. Registration in this course is restricted.

Social Science

SS 101 Introduction to Sociology

3 cr S

This course is a survey of Sociology and designed to cover the study of society, organizations, social interactions, socialization, institutions, deviance and social control stratification, ethnic and racial minorities, gender and the family, education, religion and other topics from a sociological perspective.

Little Big Horn College Core Requirements

The following information is of general interest to the student. You should consult a four-year university catalog as well as contacting the STEM consultant to ensure that classes are chosen wisely when preparing your students for the adventure ahead. Listed on the next page are the core requirements; these should be chosen wisely to eliminate excess semesters when the students are ready to matriculate into Little Big Horn College.

CORE REQUIREMENTS

All students must fulfill the CORE REQUIREMENTS as a foundation to their programs of study. In order to graduate from LBHC, students will need to complete **35 credits in the following categories**. Advisors will assist the student with selection of Core Requirements. Courses may not be substituted for Core Requirements courses.

Category I: Communication Arts	Credits	Fall	Spring
*9 Credits must be completed in this category			
CA 101 Composition I	3	X	X
CA 102 Advanced Writing	3		X
CA 203 Research Writing	3	X	
CA 112-Public Speaking	3	X	X
Category 2: Crow Studies			
*6 Credits must be completed in this category			
CS 101 Crow Language I (Required)	3	X	X
CS 122 Crow Social Familial	3		X
CS 211 Thought and Philosophy	3	X	
Category 3: Science (must include one lab course)			
*7 to 8 Credits must be completed in this category			
One Life Science:			
SC 110 Principles of Biology /Lab	3+1	X	
SC 112 Biodiversity/Lab	3+1		X
One Physical Science:			
SC 121 Fundamentals of Gen Chemistry/Lab	3+1	X	
SC 101 Mysteries of the Sky	3	X	X
SC 116 Physical World Around Us / Lab	3+1	X	
Category 4: Mathematics			
* 4 Credits must be completed in this category			
MA 150 Finite Math	4	X	X
MA 165 Pre Calculus	4	X	X
Category 5: Information Systems			
*3 Credits must be completed in this category			
IS 101-103 Introduction to Computers	3	X	X
Category 6: Humanities			
*3 Credits must be completed in this category			
CA 106 Intro to Literature	3		X
CS 108 Literature of the American Indian	3	X	
HU 101 Survey of Humanities	3		X
Category 7: Social Sciences			
*3 Credits must be completed in this category			
PY 101 General Psychology	3	X	X
SS 101 Introduction to Sociology	3		X
AN 111 Cultural Anthropology	3		X

TOTAL CORE REQUIREMENTS: 35 CREDITS

Student STEM Worksheet For Plenty Coups High School

Pre-Nursing & Medical Sciences

Pursuing a career in the medical field is a very admirable notion. Listed below are courses that you can take over the next few years to better prepare you for such a career. You may have a few questions as to why these courses are relevant. Well, here are the answers. First off, if you want to become a nurse, a doctor, a veterinarian, an optometrist, a pharmacist, a dentist, a physical therapist, or pursue any other career in medicine it is very important that you have a good understanding of how organisms adapt and survive in different environments. Taking Biology II will supplement the information you picked up in Biology I and reinforce the concepts learned there. Biology II covers human anatomy and physiology, a subject that is very important to this plan of study, and ecology. Many of the illnesses that you will treat require that you have a working knowledge of bacteria, viruses, and animals. The chemistry, though sometimes difficult and tedious, is very important. There is an enormous amount of chemistry that goes along with medicine. How each medication affects an organism is based solely on its chemical properties. So why should there be so much math? Each one of the career choices from above requires careful observation, deduction skills, and most of all, the ability to calculate. The math skills you will acquire will aid you immensely as you pursue your college degree. After all, physics is nothing more than applied math and chemistry is derived from physics. Biology is derived from chemistry, therefore a good math base is essential to success. Each of these courses should give you an advantage as you start acquiring the skills necessary for pursuing one of these exciting careers. Good Luck!!!

Put a check in the appropriate space below to keep track of the courses you need to take your junior and senior years.

<u>Course Name</u>	Junior Year		Senior Year	
	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>
English III	___	___	___	___
Algebra II	___	___	___	___
Trigonometry/Calculus	___	___	___	___
Biology II	___	___	___	___
Chemistry	___	___	___	___
Advanced Phys Ed	___	___	___	___
English IV	___	___	___	___