Northern Oklahoma College
Associate in Science--Biological Sciences 006
Options: Pre-Medicine, Pre-Pharmacy

Based on the thorough internal or external program review addressing all criteria in policy, a comprehensive report should be possible within ten or fewer pages. This program review template is provided to assist institutions in compiling the program review information, which is to be presented to the institutional governing board prior to submission to the State Regents. Executive Summaries should be possible within two pages using the provided template (Program Review Executive Summary Template).

Description of the program's connection to the institutional mission and goals:

The Mission of Northern Oklahoma College, the State's oldest community college, is a multi-campus, land-grant institution that provides high quality, accessible, and affordable educational opportunities and services which create life-changing experiences and develop students as effective learners and leaders within their communities in a connected, ever-changing world.

Northern Oklahoma College will be recognized as a model institution and leader in academic quality and cultural enrichment, promoting student success, collaborative learning, creative and forward thinking, and community responsiveness.

The core values of Northern Oklahoma College are that through personalized education we believe in providing individualized services leading our students to achieve their academic goals in a welcoming and safe environment, and we will provide support to students in and out of the classroom so that they receive a full college experience with diverse opportunities.

Another core value is community and civic engagement. We believe that educated citizens are necessary for a healthy, democratic society, and that free and open expression and an appreciation for diversity are cornerstones of higher education, and we believe in economic and environmental sustainability and the importance of enriching the intellectual, artistic, economic, and social resources of our communities.

We at Northern Oklahoma College also believe in the inherent value of intellectual pursuit for both personal and professional growth, as well as the need to prepare students for the 21st century professions, and that a knowledge-centered institution is vital to a knowledge-based economy, and we measure our success against national models and standards of excellence.

3.7.5 Process (Internal/External Review):
Previous Reviews and Actions from those reviews:

Analysis and Assessment (including quantitative and qualitative measures) noting key findings from internal or external reviews and including developments since the last review:

- The Biological Sciences degree has 20 hours of program requirements and 3-4 hours of recommended program electives.
- The Pre-Medicine option has 24 hours of program requirements.
- The Pre-Pharmacy option has 20 hours of program requirements and 3 hours of recommended program electives.
- There are currently 9 FTE faculty members for the Biological Sciences degree across NOC's 3 campuses.
- We currently have 2 students in their 4th year at OSU Vet Med School, and 2 students in the Dental Hygiene program at OUHSC.

To insure the quality of these vital programs, a number of ongoing measures are used for program review. Northern faculty participate annually in articulation meetings at the state level to insure all courses align with partner institutions' curriculum, and faculty members also attend 2 + 2 transfer articulation meetings and regularly update articulation agreements with representatives from NWOSU and OSU, two of our closest transfer institutions, to insure students are developing the critical thinking skills and knowledge base necessary to do well in upper-level coursework. In addition, each degree program has standardized program objectives and a list of approved measurements to evaluate students' performance.

A. Centrality of the Program to the Institution's Mission:

The Mission of Northern Oklahoma College, the State's oldest community college, is a multi-campus, land-grant institution that provides high quality, accessible, and affordable educational opportunities and services which create life-changing experiences and develop students as effective learners and leaders within their communities in a connected, ever-changing world.

The Biological Sciences Degree at Northern Oklahoma College enables students to develop effective learning skills in the areas of various biological science courses that incorporate a laboratory setting. In particular, these lab experiences provide students an opportunity to develop critical thinking and problem-solving skills.

B. Vitality of the Program:

B.1.Program Objectives and Goals:

Upon the completion of the Biological Sciences degree, students will be able to:

- Evaluate using critical and analytical thinking skills to describe biological life cycles in both plants and animals.
- Correlate chemical principles to the biological sciences.
- Examine and use technology through laboratory experiments.
- Correlate the material presented in the lecture portion of the course to data collection acquired in the laboratory portions of the coursework.

B.2 Quality Indicators (including Higher Learning Commission issues):

- A grade of a "C" required in Biological Science, Chemistry and Physics courses.
- Demonstrated analytical, writing and research ability as evidenced on exams, papers and projects in the required Biological Science, Chemistry and Physics courses.

B.3. Minimum Productivity Indicators:

Time Frame (e.g.: 5 year span)	Head Count	Graduates
*Biological Science and Pre-Medicine, Pre-Pharmacy Options		
2007-2008	226* (freshmen and sophomore	24
2008-2009	142	22
2009-2010	165	16
2010-2011	166	22
2011-2012	144	35

*Numbers for 2008-2012 are unduplicated majors count and include students taking courses to gain admission into a professional program as well as those who are completing an associate degree for transfer.

B.4. Other Quantitative Measures:

a. Number of courses taught exclusively for the major program for each of the last five years and the size of classes:

Course Number	**Course Name**	**Average Size of Class**
BISI 2024-5 sections taught over 5 years	Entomology	5
BISI 2403-5 sections taught over 5 years	Intro to Wildlife Conservation	6
The following are courses targeted for pre-med and pre-pharmacy majors but that also serve the nursing degree and can provide general education electives for all students to meet the 8 hours of lab science required.		
BISI 2204-18 sections taught over 5 years	Human Physiology	20
BISI 2104-14 sections taught over 5 years	Human Anatomy	25
BISI 1314-5 sections taught	General Botany	13

over 5 years		
BISI 1414-12 sections taught over 5 years	General Zoology	16
BISI 1214-30 sections taught over 5 years	Environmental Science	18

b. Student credit hours by level generated in all major courses that make up the degree program for five years:

Course Number	**Course Name**	**Hours Generated**
BISI 1314	General Botany	260
BISI 1414	General Zoology	836
BISI 1214	Environmental Science	2104
BISI 2024	Entomology	100
BISI 2403	Intro to Wildlife Conservation	90
BISI 2204	Human Physiology	1452
BISI 2104	Human Anatomy	1416

c. Direct instructional costs for the program for the review period:

Because BISI 2024 and BISI 2403 are the only required program courses that do not serve other majors in related science fields, the instructional costs for most of the program are not exclusive to meeting program needs.
Based on the average salary and benefits for full-time faculty, each section exclusive to a degree program would cost the following:
$8277 X 84 sections of 4-credit hour courses=$695,268
$6208 X 5 sections of 3-credit hour courses=$31,040
Total Instructional Cost for Offering Program Courses: **$726,308**

Laboratories and other equipment used for program classes are also used for general education courses serving all majors so there are no other distinct costs associated with this degree.

d. The number of credits and credit hours generated in the program that support the general education component and other major programs including certificates:

Course Number	Course Name	Hours Generated
BISI 1114	General Biology	26,576
BISI 2124	Microbiology	5436
CHEM 1314	General Chemistry I	7996
CHEM 1414	General Chemistry II	1100
PHYS 1114	General Physics I	896
PHYS 1214	General Physics II	612

e. A roster of faculty members, faculty credentials and faculty credential institution(s). Also include the number of full time equivalent faculty in the specialized courses within the curriculum:

Faculty	Credential	Institution that granted degree
Tricia Moore	Masters	OSU
Dr. Kurt Campbell	DVM	OSU
Eugene Young	Masters	Ft. Hays State University
Dr. Mary Ann Harris	Ph. D.	Univ. of Arizona
Will Wiggins	Masters	Midwestern State University
Sherrie Martin Dr. Dave Monks	Masters Ph. D.	OSU OSU

f. If available, information about employment or advanced studies of graduates of the program over the past five years:

We currently have 2 students in their 4th year at OSU Vet Med School, and 2 students in the Dental Hygiene program at OUHSC.

g. If available, information about the success of students from this program who have transferred to another institution:

As one indication of student success, Northern receives annual reports of transfer students' performance in the NOC-Gateway program in Stillwater through the Memo of Understanding. In the last two years, this report has indicated that the retention rate of NOC transfer students is greater than the first year at OSU retention rate of other transfer students for each of the years studied indicating that NOC graduates are well prepared for continued success at the four-year institution.

B.5. Duplication and Demand:

In cases where program titles imply duplication, programs should be carefully compared to determine the extent of the duplication and the extent to which that duplication is unnecessary. An assessment of the demand for a program takes into account the aspirations and expectations of students, faculty, administration, and the various publics served by the program. Demand reflects the desire of people for what the program has to offer and the needs of individuals and society to be served by the program.

B.5. Duplication and Demand Issues:

Address Duplication:

Northern currently offers 2 degree options under the Biological Sciences degree: Pre-Medicine and Pre-Pharmacy. These two options contain at least 50% of the core curriculum with the remaining course work adapted to meet the requirements of specific professional programs. The coursework for the degree provides some specific focuses on issues related to different medical professions but some essential duplications in addressing general health care issues.

Address Demand:

- Career opportunities for graduates with a degree in Biological Sciences include Dental Assistant, Horticulture, Laboratory Assistant, Research, Sales, and Wildlife Production.
- Career opportunities for graduates with a degree in the Pre-Medicine Option include Chiropractor, Dental Hygienist, Doctor, Funeral Services, Nutritionist, Occupational Therapist, Optometrist, Researcher, and Physical Therapist.
- Career opportunities for graduates with a degree in Pre-Pharmacy include Pharmaceutical Research, Pharmaceutical Sales, and Pharmacy.

B.5.a. Detail demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data:

The career opportunities serviced by the Biological Sciences degree program and its corresponding program options include several entities within allied health programs. Over the past few years, there has been an increase in job opportunities within allied health areas. Due to this demand, we have seen a 28% increase in enrollment numbers over the past 5 years (2007-2012) in the required courses for the Biological Sciences degree options.
The following chart, taking data from the U.S. Bureau of Labor Statistics shows a sampling of

some of the growing needs for the professions served by the Biological Sciences degree, and projections for growth of new jobs; each of the following professions have an anticipated 20% or higher job growth rate in the coming 10 years.

OCCUPATION	DEGREE	PROJECTED NEW JOBS	2010 MEDIAN PAY
Dental Hygienists	Associate	50,000 or more	$55,000 to $74,999
Dentists	Doctoral	10,000 to 49,999	$75,000 or more
Pharmacists	Doctoral	50,000 or more	$75,000 or more
Physicians/Surgeons	Doctoral	50,000 or more	$75,000 or more

B.5.b. Detail demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data:

This degree provides the first two years of education for many health care professions, and many studies show that health care providers continue to be in high demand as evidenced by a recent *About.com Guide* article on the "Top 10 Hot Careers in Oklahoma City." Author Adam Knapp listed registered nurses as the number one area of need in the region and stated, "The health care industry is growing at an incredible pace in the entire state, and an executive at one of the state's largest hospitals recently told me that he could 'hire 300 RNs tomorrow if they were available.'"

In the Oklahoma Employment Security Commission's *Oklahoma Employment Outlook 2014,* educational and health services were listed as one of the three industries "expected to account for more than two-thirds of the state job growth" (p. 3). The OESC also projected a 20% increase in nursing and residential care facilities from 2004 to 2014 and, together with ambulatory health care and hospitals, this industry was expected to "account for 32,520 jobs, more than one-sixth of the job gains expected" for the decade (p. 7).

B.5.c. Detail demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

NA

B.5.d. Detail indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community:

The faculty and students in the biological sciences areas are encouraged to engage in community service projects, internships, and research projects related to their particular field of study/interest.

B.5.e. The process of program review should address meeting demands for the program through alternative forms of delivery. Detail how the program has met these demands:

Because the required program courses are all lab science classes there are limited alternative forms of delivery. Environmental Science is offered as an internet option during the fall semester. Some of the program courses are offered during the summer semester as well as during the long semesters.

B.6. Effective Use of Resources:

Resources include financial support, (state funds, grants and contracts, private funds, student financial aid); library collections; facilities including laboratory and computer equipment; support services, appropriate use of technology in the instructional design and delivery processes, and the human resources of faculty and staff.

In addition to the FTE faculty members that teach primarily in the biological sciences, the department utilizes newer model, state-of-the-art microscopes, microscope projection devices and Vernier probe ware and computer interfaces for some of the lab science courses. Additionally, the department recently received a substantial private donation for use in purchasing support materials and funding scholarships.

Institutional Program Recommendations: (describe detailed recommendations for the program as a result of this thorough review and how these recommendations will be implemented, as well as the timeline for key elements)

Recommendations	Implementation Plan	Target Date
Look at developing other degree options that would fit with the Biological Sciences degree to better align students into specific degree areas upon transfer.	Develop degree options using core requirement guidelines in the areas of Dental Hygiene and Physical Therapy from 4-yr institutions in the state. Spring 2014	Fall 2014
Increase marketing to target biological sciences majors.	Develop a departmental student club for Biological Sciences. Continue to increase research opportunities for students. Spring 2014	Fall 2014

Summary of Recommendations:

	Department	School/College	Institutional
Possible Recommendations:			
Expand program (# of students)	10	10	10