SEMINOLE STATE COLLEGE

# ASSOCIATE IN SCIENCE FOR LIFE SCIENCE (210)

## Program Review Summary

## October 1, 2012

### Introduction

The mission of Seminole State College is to empower people for academic success, personal development, and lifelong learning. To that end, the College offers twenty-three degree/ certificate programs, including the Associate in Science for Life Sciences. In accordance with requirements set forth by the Oklahoma State Regents for Higher Education, the College conducts a thorough review of this degree program every five years. The Math, Science, and Engineering Division presents here the results of its self-review of the Associate in Science for Life Sciences.

Assessment of this transfer degree program employed a number of direct and indirect indicators. The focus of this process was to evaluate degree program productivity and the achievement of specific degree program and general education outcomes by students. Additionally, this review relates these findings to a number of relevant Higher Learning Commission Criteria and Components, the Seminole State 2012-13 Academic Plan and the educational mission of the College. Based on the information presented here, the academic division makes recommendations regarding the degree program.

**3.7.5 Process** (Internal/External Review): Self-review by academic division
Previous Reviews and Actions from those reviews: In the previous review, recommendations addressed issues related to articulation agreements, underprepared students, and faculty advising. Faculty members utilized student support services to better prepare students, participated in a faculty-mentoring program, and prepared plans to improve articulation agreements.

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

Analysis of degree program productivity revealed that the degree program averaged about 29 declared majors per year with 11 graduates and 2,750 total credit hours generated per year over the five-year period under review. Other direct indicators used were course-embedded assessment and ACT Collegiate Assessment of Academic Proficiency (CAAP) Test. Principal indirect indicators used were the Community College Survey of Student Engagement (CCSSE), the ACT Faces of the Future Survey (biennial survey), and the SSC Graduate Opinion Survey. Students increased knowledge by a 4.8 to 1 ratio in a comparison of the pre-test and post-test scores. The CAAP test scores reflect learning in line with the national averages. The data reported on the CCSSE reflected the commuter campus atmosphere of Seminole State College. The ACT Faces of the Future Survey revealed that at least 50% of students reported a major life event such as losing or changing jobs.

**Key findings from the most current evaluation of the Associate in Science for Life Sciences**

Faculty in the MSE Division discovered a need to develop a plan to increase student and faculty awareness of the articulation agreements among colleges and universities in the state system and the advantage of receiving an associate degree before transferring to a regional institution. Faculty found a need for increased efforts to encourage students to enroll in and a follow specific degree program rather than choosing General Studies.

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

**SSC Mission Statement**

Seminole State College empowers people for academic success, personal development, and lifelong learning.

The Associate in Science for Life Sciences Degree Program:
**Empowers people for academic success** by preparing students for a range of careers involving Life Sciences and at the same time improve their critical thinking skills necessary for success in all studies.
**Empowers people for personal development** by training students to set and achieve educational goals by developing responsibility, organizational skills, and academic skills. The program places students in appropriate developmental or college level courses, allowing students the opportunity to progress through the curriculum to achieve success.
**Empowers people for life-long learning** by providing a variety of courses that vary in content and have the purpose of broadening a student's appreciation of and creating a desire for continued learning once they have completed their education.

Seminole State College prepares students to continue their education beyond the two-year level, trains students for careers and other educational opportunities, and makes available resources and services designed to benefit students and the community at large. Seminole State College also enhances the capabilities of individuals to achieve their goals for personal development by providing quality learning experiences and services that respond to diverse individual and community needs in a changing global society.

**B.** Vitality of the Program:

**B.1**.Program Objectives and Goals:

**Associate in Science in Life Sciences Degree Program Outcomes**
**Outcomes for Transfer Degree Programs**

Outcome 1: Demonstrate successful articulation of Seminole State College transfer degree programs to state and professional institutions of higher learning granting professional and baccalaureate degrees in Oklahoma.

Outcome 2: Demonstrate successful academic achievement by Seminole State College transfer degree students at primary receiving state baccalaureate institutions of higher learning in Oklahoma. Successful academic achievement is defined as the maintenance of satisfactory academic progress toward degree completion as determined by the receiving institution.

**Outcomes Specific to Associate of Science for Life Sciences**

Outcome 3: Demonstrate a grasp of biological and related concepts foundational to advanced courses in Life Sciences. Advanced courses shall be defined as courses commonly considered Junior and Senior level at baccalaureate degree granting institutions.

Outcome 4: Demonstrate preparation for continued pursuit of Life Science education leading to a baccalaureate or professional degree in a branch of the Life Sciences.

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

The SSC Life Science Degree Program fulfills Higher Learning Commission Criteria by providing evidence of student learning, faculty engagement that encourages quality teaching, and effective assessment of the student learning process. Instructors in the Mathematics and Science areas consistently review assessment tools and methods and revise those tools and methods, when necessary, to provide the most accurate assessment data possible. To measure the two outcomes specific to the Life Sciences Degree Program course embedded assessment is the foremost method. In the Mathematics and Science areas, instructors used pre-tests and post-tests as the tools to obtain assessment data. Faculty members regularly review and change pre-test and post-test questions when necessary. For example, in the past year mathematics and science faculty members have reviewed the pre-tests and post-tests in College Algebra, General Biology, Zoology, Anatomy, Physiology, Astronomy, Microbiology, Principles of Biology, Earth Science, and Introduction to Engineering. As a result, instructors have rewritten, replaced, or deleted some of the existing questions. This process illustrates that the Life Science Degree Program fulfills academic priorities such as improving the assessment of student learning and striving for instructional quality as emphasized in the SSC Institutional Degree Completion and Academic Plans, 2012-2013 Outline.

Instructors calculate student score improvements from pre-test to post-test for every class every semester. While pre-tests and post-tests only assess improvements in a sampling of course objectives, the fact that all courses in the Mathematics and Science areas show improvement verifies that student learning takes place and that outcomes specific to the Life Sciences Degree Program are met.

As an example, key personnel gathered course embedded assessment data from the spring 2010 and fall 2010 semesters as shown in the following table. The percent of increase reflects the difference between the average of the post-test scores and the pre-test scores. For all thirteen of the Major Field courses, the average growth rate was 55.7%. The overall ratio of post-test scores to pre-test scores was 4.8 to 1 (70.3% to 14.7%).

**Table 1**

| **Combined Course Embedded Assessment Results For Spring and Fall, 2010** | |
|---|---|
| **General Education Outcomes** | **Percent of Increase** |
| General Education Outcome 1 | 60% |
| General Education Outcome 2 | 49% |
| General Education Outcome 3 | 63% |
| General Education Outcome 4 | 64% |
| **Specific Outcomes for Life Sciences** | **Percent of Increase** |
| Degree Program Outcome 3 | 49% |
| Degree Program Outcome 4 | 49% |

**B.3.** Minimum Productivity Indicators:

The following table provides data for the Life Sciences Degree Program. Report Date May, 2012

**Table 2**

| Life Sciences Declared Majors and Graduates | | | |
|---|---|---|---|
| **Academic Year** | **Semester** | **Declared Majors** | **Graduates Total Per Year** |
| 2007 - 2008 | Fall 2007 | 31 | |
| | Spring 2008 | 36 | 15 |
| | OSRHE Non-duplicated Headcount | 32 | |
| 2008 - 2009 | Fall 2008 | 25 | |
| | Spring 2009 | 21 | 9 |
| | OSRHE Non-duplicated Headcount | 25 | |
| 2009 - 2010 | Fall 2009 | 29 | |
| | Spring 2010 | 29 | 10 |
| | OSRHE Non-duplicated Headcount | 30 | |
| 2010 – 2011 | Fall 2010 | 27 | |
| | Spring 2011 | 25 | 11 |
| | OSRHE Non-duplicated Headcount | Not Available | |
| 2011 - 2012 | Fall 2011 | 30 | |
| | Spring 2012 | 29 | 9 |
| | OSRHE Non-duplicated Headcount | Not Available | |

In Table 2, the results show approximately 29 students selecting the program each year and about 11 successfully completing the program annually. This degree program has a low to moderate demand level. Relative to the number of students declaring Life Sciences as a major, the graduation rate is 28%. Analysts partially attributed the low graduation rate to the concept that many of the students who declare Life Sciences as their major, succumb to the rigor of the courses and do not complete their degree or decide to change majors. Additionally, a significant number of students transfer to other institutions before completing an associate degree at Seminole State College.

This data shows that the Life Sciences Degree Program exceeds the minimum standards of productivity for Majors Enrolled (25) and Degrees Conferred (5).

**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:

Since all courses offered in this major may be used as lower division general education courses, no courses exclusively for this degree were taught in the past five years. However, the thirteen courses considered major courses for this program are listed in Table 5. The classes range in size from 10 to 50 students.

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

**Student Credit Hours Generated in the Major Courses (Five Year Period)**

Table 3

| Academic Year | Total Hours Generated |
|---|---|
| 2006 - 2007 | 2816 |
| 2007 - 2008 | 2500 |
| 2008 - 2009 | 2340 |
| 2009 - 2010 | 3139 |
| 2010 - 2011 | 2958 |

Note: In Table 3, the "Total Hours Generated" column represents the student credit hours generated by all the Major courses of the degree program for the given academic year. The hours do not represent the number of student credit hours generated only by those students declaring Life Sciences as their major.

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

**Instructional Cost (Estimate):**

No direct data was available that could be used to determine the exact amount of the instructional cost for any of the math and science degree programs. The annual SSC budget report provided the total expenditures for the science department as shown in Table 4. The annual science department budget contains the instructional costs for four of the MSE division degree programs.

Table 4

| Academic Year | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 |
|---|---|---|---|---|---|
| Instructional Cost | $529,644 | $563,202 | 508,325 | $463,764 | $496,559 |

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

**Support of General Education Outcomes**

All courses offered in the Mathematics and Science areas support the General Education Philosophy of Seminole State College. Mathematics and Science instructors make every effort to provide experiences that will equip students with the necessary skills to make informed decisions and encourage life-long learning. Instructors also attempt to provide experiences that will make students into citizens who will be thoughtful about their attitudes toward human life, cultural diversity and biological and physical environments. Please see Table 3 for a list of student credit hours generated in the major courses.

All college level courses in the Science area at Seminole State College support one or more of the General Education Outcomes. As students successfully progress through the course offerings in the Life Sciences Degree Program, they will eventually achieve all four General Education Outcomes. To illustrate this support of the General Education Outcomes Table 5 shows the Major Field courses for the Associate in Science for Life Sciences Degree Program and the General Education Outcomes each course addresses.

Table 5

All General Education Outcomes addressed by a specific course are marked with the letter "X."

| Major Field Course Information | | | General Education Outcome | | | |
|---|---|---|---|---|---|---|
| Prefix | Number | Title | 1 | 2 | 3 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ANAT | 2114 | Human Anatomy | X | X | X | X |
| BIOL | 1214 | Principles of Biology | X | X | X | X |
| BIOL | 2113 | Introduction to Nutrition | X | X | | |
| BIOL | 2214 | Human Physiology | X | X | X | X |
| BOT | 1114 | General Botany | X | X | X | X |
| CHEM | 1114 | Introduction to Chemistry | | X | | |
| CHEM | 1315 | General Chemistry I | | X | | |
| CHEM | 1515 | General Chemistry II | | X | | |
| MICRO | 2224 | Microbiology | X | X | | |
| PHYS | 2114 | General Physics I | X | X | | |
| PHYS | 2224 | General Physics II | X | X | | |
| PHYS | 2212 | Calculus Based Physics | X | X | X | |
| ZOO | 1114 | General Zoology | X | X | | |

**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:

**Current Mathematics/Science/Engineering Division Faculty**

**Table 6**

| Current Full-Time Mathematics/Science/Engineering Faculty | | | |
|---|---|---|---|
| **Name** | **Teaching Area** | **Highest Degree** | **Institution** |
| Bryant, Melissa | Mathematics | M.Ed. | East Central University |
| Eberhart, Lori | Science | M.S. | Oklahoma State University |
| Goeller, Linda | Mathematics | Ph.D. | Oklahoma State University |
| Helseth, Dave | Science | M.S. | Oklahoma State University |
| Jobe, Noble | Science | Ph.D. | Oklahoma State University |
| Laule, Gerhard | Science | M.S. | University of Arkansas |
| Mills, Jamie | Mathematics | M.Ed. | East Central University |
| Rush, Loretta | Science | M.Ed. | East Central University |
| Tollett, Jarrod | Mathematics / Science | M.Ed. | East Central University |
| Troglin, Annette | Mathematics | M.Ed. | East Central University |
| **Current Full-Time Faculty From Other Divisions Teaching MSE Classes (Instructors with ** beside their name teach only zero-level classes)** | | | |
| Duval, Charlie ** | HPER / Mathematics | M.Ed. | East Central University |
| **Current Adjunct Mathematics/Science/Engineering Faculty (Instructors with ** beside their name teach only zero-level classes)** | | | |
| Birdwell, Larry | Mathematics | M.S. | Oklahoma State University |
| Crane, Michelle ** | Mathematics | B.S. | East Central University |
| Neal, Helen ** | Mathematics | B.S. | East Central University |
| Qualls, Travis | Mathematics | M.Ed. | East Central University |
| Williams, Beverly | Science | M.Ed. | East Central University |
| Wilson, Barbara | Science | M.S. & M.Ed. | OU / East Central University |

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

No data

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

**Transfer Reports from Four-Year Institutions:**

Seminole State College routinely seeks transfer data from the primary transfer baccalaureate institutions but receipt of transfer data from those institutions has been sporadic. Transfer reports received from East Central University, the University of Central Oklahoma, and Oklahoma State University provided GPAs of students who had transferred from Seminole State College. Data in those reports, cited in the 2009 Seminole State College HLC Self-Study Report, indicated that "Students' GPAs typically only decrease 0.25 on the 4.0 scale upon transferring from SSC .... This decrease is considered not as a reflection of SSC's curriculum, but the fact that at the university, students take more advanced, junior, and senior level courses in their majors." The data in those reports confirmed our expectation that SSC students maintain similar GPAs upon transfer as those attained at SSC and verified the competence of SSC students in their academic preparation.

**B.5.** Duplication and Demand:

**B.5.** Duplication and Demand Issues:

**Review of Duplicated Programs**

Seminole State College provides local access to students in our five county service area wishing to pursue the Life Sciences Degree. The only near duplications (in our five county area) are a few private schools that are cost prohibitive for many students.

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

The Life Sciences Degree is a low to moderate demand program and the rates of declared majors and graduation exceed OSRHE productivity levels. Approximately 29 students selected the Associate in Science in Life Science degree program each year over the review period. Fifteen students in 07-08, 10 students in 08-09, 10 in 09-10, and 11 in 10-11 successfully completed the program. Relative to the number of students declaring Life Science as a major, the graduation rate is 28%. The students in the Life Science degree program are predominately under the age of 24 at 78.2%. The number of under-prepared learners following this program ranged from 7 to 13 as indicated by the Life Science ACT scores 19 and under. There exists in the program a relatively high percentage of under-prepared students declaring Life Science as a major as indicated by ACT scores.

**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:

Faculty members expect students with a Life Sciences Degree to matriculate to a four-year program. The options available to these students include fields such as education, research, health care, and consultancy.

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

Not applicable to SSC.

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

Although many of the faculty members commute, they also participate in community activities such as blood drives, Lion's Club, churches, and the local chambers of commerce. Faculty members and students actively participate in the five county area communities served by SSC.

**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:

With the advances in technology, faculty members have the opportunity to expand to several different forms of delivery. Although still experimenting with new methods, faculty members have found that hybrid or blended courses and IETV prove to be successful delivery methods. SSC also addresses the community need for a variety of course scheduling by offering night courses, weekend courses, 8-week courses, and courses at correctional facilities.

**B.6**. Effective Use of Resources:

**Staff Support**

The MSE Division has a full-time secretary who primarily supports the Division Chair, and secondarily supports the other functions of the division including purchasing, maintaining budgets and various records, and facilitating the various needs of the MSE faculty members. There are currently two student wage students working for the MSE Division.

**Educational Technology Support**

The infusion of technology into academic programs and processes currently receives priority implementation and funding at Seminole State College. Through this focus, the College creates a technologically enhanced academic environment focused on student learning. As a result, technology has never been a limiting factor in classroom instruction. Primary funding sources are E&G funds, federal grants, dedicated student fees, and private donations.

Seminole State College installed a wireless network with two control centers providing Internet and Seminole State College Intranet connectivity to campus academic and residential buildings. In addition to wireless connectivity, all classrooms are hard-wired for Internet and Seminole State College Intranet access. Students have access to personal email accounts, online enrollment, student records, and can obtain copies of their transcripts online. Students may use one of the computers in 16 computer labs stationed across campus to access these sites. Technologically equipped classrooms have computer systems with current instructional and multimedia software, CD/DVD/VCR players, digital multimedia projectors and a Smart Board. Classrooms equipped for IETV have full-motion video/audio interactive television technology interfaced with fiber optic transmission equipment and a computerized multimedia projection system for OneNet course sharing. Faculty members use the internet for instructional activities and information research in courses throughout the curriculum.

Technological services provided by the Testing Center include computerized Advanced Placement testing, class placement testing, ACT residual testing, telecourse testing, and

technologically-aided ADA appropriate testing for students with special needs.

**Instructional Technology Support Services**
Maintaining all forms of technology used in instruction requires a qualified support team. Seminole State College has just such a team made up of the MIS director and two tech persons. They are responsible for maintaining all campus technology such as computers, Smart Boards, IETV equipment, and keeping the campus Intranet and Internet operable in all offices and classrooms.

**Web-based Support Services**
Campus Cruiser is available to instructors for course management and not just for online course delivery. Through Campus Connect, instructors report student grades electronically, receive emergency response, and make announcements.

**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)

**Table 7**

| Recommendation | Implementation Plan | Target Date |
|---|---|---|
| Increase student and faculty awareness of the articulation agreements between colleges and universities in the state system and the advantage of receiving an associate degree before transferring to a four-year institution. | MSE faculty plan to increase student and faculty awareness of the articulation agreements between colleges and universities in the state system and alert them to the advantage of receiving an associate degree before transferring to a four-year institution. Increased contact between faculty in the major area and students enrolled in the degree program will result from a faculty mentor program in progress. | On-going |
| Encourage students to enroll in specific degree programs rather than choosing General Studies | Faculty, along with student support services, will continue the efforts to inform students of the advantages of enrolling in a specific MSE degree program by implementing a degree enrollment plan currently advancing through implementation stages. | On-going |

**Summary of Recommendations:**

| | Department | School/College | Institutional |
|---|---|---|---|
| **Possible Recommendations:** | | | |
| Expand program (# of students) | We recommend expanding the program by 10% or about 3 students per year. | | |
| Maintain program at current level | | | |
| Reduce program in size or scope | | | |
| Reorganize program | | | |
| Suspend program | | | |
| Delete program | | | |

Department/
Program Head Annette Teaglin (Signature) Date 11/23/12

Dean [signature] (Signature) Date 12-18-12