Program Review Report
3.7 Academic Program Review

A thorough internal or external program review addressing all criteria in policy should be possible within a comprehensive report of ten or fewer pages. This 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.

Institution Name: Seminole State College

Program Name and State Regents Code: Pre-Engineering Associates in Science (214)

List Program Options: Click here to enter text
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List Embedded Certificates included in this review: Click here to enter text
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Previous Review

Date (Year) of Last Review 2018

1. Summarize key findings from previous internal and/or external reviews of this program.

Analysts found 1) faculty and counselors should be more active in recruiting students to declare Pre-Engineering as a major, 2) faculty in the STEM division discovered a need to create a plan to increase student awareness of the advantage of receiving an associate degree before transferring to a four-year institution, and 3) data revealed a continuing issue with the number of students allowed to enroll in Liberal Studies, leading to the conclusion that more concerted effort should be made to encourage students in selecting a specific major.

2. What developments and actions have taken place since the last review?

Faculty in the STEM division have worked with campus recruiting to differentiate the Pre-Engineering AS from the Engineering Technology AAS degree programs. In addition to these discussions with recruiting, it has been stressed that the Pre-Engineering pathway contains a more rigorous mathematics background and more detail should be given to students choosing Pre-Engineering course schedules to reach degree completion in four semesters. The STEM division has worked to align the engineering, physics, and mathematics courses to prevent overlap in scheduling for required coursework. Since the last review period, our campus initiative has been focused on Math Pathways, which attempts to funnel students into math courses based on majors. This initiative, combined with corequisite remediation efforts in the math courses, has shrank the number of students enrolled in Pre-Calculus for Engineering and Physics (traditionally College Algebra) into a cohort group focused on the same courses allowing more meaningful peer to peer groups to develop organically. Right after the last degree program review, an Advisory Board consisting of local business and industry was created with the intent to help the Engineering programs at SSC grow and fill positions within the growing workforce. The advisory board has not been utilized since the 2020 pandemic. Data from the Educational Testing Service (ETS) compares our students general

education to other two year institutions across the nation. The SSC scores show our student score averages are very closely matched with scores across the nation, but national scores and SSC scores for Critical Thinking are low. This is of concern and will need to be addressed. With all these changes, many of the program changes will take significant time to determine how the changes will affect the Pre-Engineering program.

Current Review

Date (Year) of Current Review 2023

Review Criteria *(Institutions should address each criterion of OSRHE policy 3.7.5 as directed below).*

A. Vitality of the Program:

A.1. Program Objectives and Goals:

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

Measurable Indicators

a. Signed 2+2 articulation agreements between SSC and state baccalaureate institutions of higher learning in Oklahoma, especially those institutions which are primary recipients of SSC transfer degree program graduates.

b. Inclusion of required degree program courses on the Oklahoma State Regents for Higher Education annual Course Equivalency Matrix.

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.

Measurable Indicators

a. Transfer data on SSC transfer degree program graduates from primary receiving state baccalaureate institutions of higher learning in Oklahoma.

b. Graduate Opinion Survey data self-reporting demonstration of successful academic achievement at primary receiving state baccalaureate institutions of higher learning in Oklahoma as available

c. Retention reports on SSC transfer program graduates regarding primary receiving state baccalaureate institutions of higher learning in Oklahoma as available.

d. Graduation reports on SSC transfer program graduates regarding primary receiving state baccalaureate institutions of higher learning in Oklahoma as available.

Outcomes Specific to Associate of Science in Pre-Engineering (214)

Outcome 3: Define and explain fundamental concepts, principles, and theories of engineering.

Measurable Indicators

Assessment data demonstrating students' ability to:

a. Identify concepts, principles, and theories related to various engineering phenomena.

b. Explain how concepts, principles, and theories correlate with various engineering phenomena.

Outcome 4: Gather scientific information through experiments and interpret and express the results of experiments.

Measurable Indicators
Assessment data demonstrating students' ability to:

a. Perform experiments and collect data from the experimental result,
b. Interpret experimental results as related to concepts, principles, and theories of engineering,

Outcome 5: Demonstrate problem-solving skills foundational to understanding of engineering concepts.

Measurable Indicators
Assessment data demonstrating students' ability to:

a. Analyze a problem,
b. Recognize the concept(s) and technique(s) necessary for solution,
c. Apply the concept(s) and technique(s),
d. Verify the results,
e. Communicate the results in an understandable manner.

Outcome 6: Demonstrate preparation for continued pursuit of engineering education leading to a baccalaureate degree in an engineering area.

Measurable Indicators
Assessment data demonstrating students' ability to:

a. Describe various fields of engineering
b. Interpret and manipulate data,
c. Apply scientific knowledge to problem-solving,
d. Apply critical thinking.

A.2. Quality Indicators (including Higher Learning Commission criteria and requirements):

The SSC Pre-Engineering Associates in Science Degree Program (214) fulfills Higher Learning Commission Criterion 3 & Criterion 4 by providing evidence of student learning, faculty engagement encouraging quality teaching practices, and effective assessment of the student learning process. Faculty in the Science Technology Engineering and Mathematics (STEM) division 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 four outcomes specific to the Pre-Engineering Associates in Science Degree Program course embedded assessment is the foremost method. In the STEM division, instructors use pre/posttests as the tools to obtain assessment data. Faculty members regularly review and change pre/posttest questions when necessary. As a result, faculty have rewritten, replaced, or deleted some of the existing questions. Faculty calculate pre/posttest score improvements for every class every semester. Although pre/posttest assessments only focus on a specific course's learning objectives, an examination of all STEM courses shows improvement, which verifies student learning is taking place and that the outcomes specific to the Pre-Engineering Associates in Science Degree Program are being met. Table 1 below shows FY2022-2023 Combined Course Embedded Assessment Results for the Pre-Engineering Associates in Science Degree Program. While the General Education Outcome 1 Percentage Increase is at the minimum threshold established by the SSC Assessment of Student Learning Committee, the Posttest score is well above the 60% minimum (that would require establishing a progress evaluation and initialize an internal review process).

Table 1. Combined Course Embedded Assessment Results for FY2022-2023 for Pre-Engineering Associates in Science			
Outcomes	**Pre-Test % Correct**	**Post-Test % Correct**	**Percentage Increase**
General Education Outcome 1	48%	73%	25%
General Education Outcome 2	29%	83%	55%
General Education Outcome 3	55%	80%	24%
General Education Outcome 4	41%	92%	51%
Program Outcome 3	29%	83%	55%
Program Outcome 4	21%	82%	60%
Program Outcome 5	26%	82%	56%
Program Outcome 6	26%	84%	58%

A.3. Minimum Productivity Indicators:

Time Frame (e.g.: 5-year span)	Enrollment	Graduates
FY2017-2018	41	8
FY2018-2019	31	5
FY2019-2020	29	4
FY2020-2021	27	4
FY2021-2022	19	3

A.4. Other Quantitative Measures:

a.4.a. Number and enrollment of courses taught exclusively for the major for each of the last five years:

None. ENGR 1113 Introduction to Engineering is not exclusive to the major and is the only ENGR course required for the Pre-Engineering Associates in Science degree offered at Seminole State College.

a.4.b. Student credit hours by course level (i.e. 1000, 2000) generated in all major courses in the degree program for five years:

87 courses were taught generating 2916 Earned Credit hours (having 3542 attempted hours). Enrollment in these 87 courses was 1028 for the review period.

a.4.c. Direct instructional costs for the program during the review period:
No direct data were 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 S.T.E.M. division degree programs. State allocated STEM allocations have been

made available uniquely since 2020 but have also been utilized through the Health Science division.

Table 4

Academic Year	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Instructional Cost	$329.897.05	$562, 778	$906,012	$903,307	$1,088,265

a.4.d. The number of credits and credit hours generated in the program that support the general education component and other degree programs including certificates:

ENGR 1113 Introduction to Engineering (3 hour credit course) supports another degree program. This course generated 216 Earned Credit Hours during the review period.

a.4.e. If available, information about employment or advanced studies of graduates of the program over the past five years:

18 Students have gone on to pursue Baccalaureate degrees. At least three of these have completed degrees in engineering and are now in the workforce.

a.4.f. If available, information about the success of students from this program who transferred to other institutions:

Seminole State currently does not have a mechanism to track transfer students by degree, but Table 2 below describes the transfer data from all graduates to the following four institutions of higher education.

Table 2. 2022-2023 Transfer Reports from Four-Year Institutions

Four Year Institution	**Number of Former SSC Students Enrolled**	**Credit Hours Completed**	**Credit Hours Attempted**	**Course Completion Rate**	**Aggregated GPA of Former SSC Students**	**Aggregated Student Body GPA**	**Difference**	**Bachelor's Degrees Awarded**
East Central University	360	7483	8068	92.75%	3.13	3.02	0.11	55
Oklahoma State University	249	*	*	*	3.22	3.21	0.01	56
University of Oklahoma	147	2935	3043	96.45%	3.23	**	**	29
University of Central Oklahoma	235	3711	4278	86.75%	3.04	3.03	0.01	48
Totals	991	14129	15389	91.8%				188

*Data from OSU not reported in the correct format.

**Data from OU did not provide aggregated student body data, but Summer difference +0.13, Fall difference -0.11, and Spring difference -0.04.

Recommendation(s)

A. Recommendation for the Program (3.7.7.A.4):

- ☒ Maintain the program at the current level.
- ☐ Continue the program with modifications as noted below and detailed in the comment section below.
  - ☐ Expand the program
  - ☐ Reduce program in size or scope
  - ☐ Merge or consolidate program
  - ☐ Reorganize program/curricular modifications*
- ☐ Suspend program to allow an opportunity to consider recommendations detailed in the section below*
- ☐ Delete program*

**Requires a Request for Degree Program Modification and governing board approval.*

B. Specific comments regarding recommendations:

(Provide 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 to suspend or modify the program should include measurable goals and a timeline for monitoring the program in one-, two-, three-, or four-year increments)

Recommendations	Implementation Plan	Target Date
Reestablish connection with campus recruiting given new advising director and focus recruiting efforts on increased enrollment	Schedule meeting with all recruitment stakeholders and VPSA by 3/1/204. Provide recruitment materials to all recruiters and advisors. The degree program mentor will also plan to attend various area recruiting events in the spring 2024 semester.	5/1/2024
Seek NSF funding to add a certificate program for SolidWorks as a part of the existing degree program	The Pre-Engineering degree program mentor will explore NSF funding opportunities during the 2023-2024 year and apply for 2025-2026 grant year. Involved faculty will be provided with training and necessary equipment/software prior to target date.	10/1/2025
Create an articulation agreement with Oklahoma Baptist University with a possible emphasis to aid in student transfer given their new Engineering program	SSC division chair and Pre-Engineering degree program mentor will visit with OBU faculty by 5/1/2025. Further communication regarding the articulation agreement will commence with the document prepared for the 2027-2028 catalog year. Student meetings and visits to OBU's campus as a part of transfer efforts may be scheduled as well in 2026-2027 school year.	8/1/2027

Add additional rows as necessary

Department/
Program Head ***Emily Carpenter*** Date: **10/5/2023**
(Signature)

Chief Academic Officer Amanda Estes Date: **10/9/2023**
(Signature)

President Lana Reynolds Date: **10/26/2023**
(Signature)