UAA Academic Affairs
UNIVERSITY *of* ALASKA ANCHORAGE

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2021 ANNUAL ACADEMIC ASSESSMENT REPORT FORM
(Due October 15 to the dean)

PROGRAM SECTION (Due to the dean on October 15)

Submission date: 1/27/2022

Submitted by: Frank W. Moore, Professor and Chair, fwmoore@alaska.edu

Program(s) covered in this report: Computer Systems Engineering BS
(Programs with suspended admissions and new programs in the first year of implementation are not required to complete this form.)

   If you selected "Other" above, please identify. *(100 characters or less)*

College: College of Engineering

Campuses where the program(s) is delivered: ☒**Anchorage** ☐**KOD** ☐**KPC** ☐**MSC** ☐**PWSC**

Specialized accrediting agency (if applicable): Select Specialized Accrediting Agency or N/A.
   If explanation is necessary, such as only some of the certificates and degrees are covered by the specialized accreditation, briefly describe: The BSCSE degree program is accredited by the Engineering Accreditation Commission of ABET, Inc.

INSTITUTIONAL STUDENT LEARNING CORE COMPETENCIES

In 2020, UAA launched a consensus-based, deliberative process to identify the key skillsets that help students achieve academic and post-graduation success. After a year-long process that included students, faculty, staff, administrators, alumni, and employers, the UAA community identified four "core competencies" at the heart of a quality UAA education. Students develop mastery of these competencies through curricular (e.g., courses), co-curricular (e.g., internships, conferences), and extra-curricular (e.g., student clubs) learning experiences.

After the stakeholder-based process in AY20, UAA conducted a pilot project focusing on the core competency of Personal, Professional, and Community Responsibility (PPCR). This decision was based on input from the 2020 Annual Academic Assessment Retreat.

Question #1 below is designed to engage program faculty in thinking about how they can or already do promote student learning in this core competency.

1. **Personal, Professional, and Community Responsibility: The knowledge and skills necessary to promote personal flourishing, professional excellence, and community engagement.**

- o **What would you hope a student would say if asked where in your program or support service they had the opportunity to develop proficiency in this Core Competency?** *(500 characters or less)*
  Students learn about these subjects in General Education classes; PHIL A305 Professional Ethics; and the CSCE A470 Capstone Course.

- o **Do you have an example that could be a model for the university of an intentionally designed course, assignment, or activity that showcases the student learning in this core competency?** ☐Yes ☒No
  If yes, please briefly describe. *(500 characters or less)*

- o **Do you have any ideas about where your program or the university might develop other intentionally designed opportunities for students to develop proficiency in this core competency?** ☐Yes ☒No
  If yes, please briefly describe. *(500 characters or less)*

PROGRAM STUDENT LEARNING OUTCOMES

2. **Please list the Program Student Learning Outcomes your program assessed in AY21. For each outcome, indicate one of the following: Exceeded faculty expectations, Met faculty expectations, or Did not meet faculty expectations.**

   Example: Communicate effectively in a variety of contexts and formats – Exceeded faculty expectations.
   All seven Program Student Learning Outcomes were assessed. These are:

   Outcome 1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. Met faculty expectations.

   Outcome 2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. Did not meet faculty expectations.

   Outcome 3: An ability to communicate effectively with a range of audiences, including technical and non-technical audiences for business, end-user, client, and computing contexts. Met faculty expectations.

   Outcome 4 Data: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. Met faculty expectations.

   Outcome 5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. Exceeded faculty expectations.

Outcome 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. Did not meet faculty expectations.

Outcome 7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. Did not meet faculty expectations.

Computer Systems Engineering is a very small program, and as a result, one can expect assessment results to vary widely from year to year. That said, the 2020-2021 assessment results show a sharp downward trend for the following outcomes:

2. Apply Engineering Design: in 2018-19, 37.5% of students were assessed as Excellent, while the remaining 62.5% were assessed as Satisfactory. In 2020-21, none of the students were assessed as Excellent, while 33.3% were assessed as Satisfactory and 66.7% were assessed as Developing.

6. Develop and Conduct Appropriate Experimentation: in 2018-19, 70.8% of students were assessed as Excellent or Satisfactory. In 2020-21, 0% were assessed as Excellent, while 50% were assessed as Poor and another 12.5% were Developing.

7. Acquire and Apply New Knowledge: In 2018-19, 95.5% of students were assessed as Excellent or Satisfactory. In 2020-21, 0% assessed as Excellent, while a full 50% assessed as Poor or Developing.

A bright spot was Outcome 5: Function on a Team. In 2020-21, 100% of students assessed as Excellent.

These results reflect poorly on the Computer Systems Engineering program. The program is producing a small number of graduates, and the assessment data indicates that these graduates are weak in three of seven assessment areas.

3. **Describe your assessment process in AY21 for these program student learning outcomes, including the collection of data, analysis of data, and faculty (and other, e.g., advisory board) conversations around the findings.** *(750 characters or less)*

Assessment data are collected from five courses, as follows:

Outcome 1: CSCE A342 (Digital Circuits Design) and CSCE A470 (Capstone)
Outcome 2: CSCE A401 (Software Engineering) and CSCE A470
Outcome 3: CSCE A401 and CSCE A470
Outcome 4: CSCE A465 (Computer and Network Security) and CSCE A470
Outcome 5: CSCE A401 and CSCE A470
Outcome 6: CSCE A448 (Computer Architecture) and CSCE A470
Outcome 7: CSCE A448 (Computer Architecture) and CSCE A470

The Department Chair analyses the data, and faculty discuss assessment results to identify specific curricular changes necessary for continuous improvement. Proposed changes are vetted with Advisory Board members before initiation of formal program change requests.

4. **What are the findings and what do they tell the faculty about student learning in your program?** *(750 characters or less)*

The Computer Systems Engineering program is doing very well in producing graduates who work well on teams (Outcome 5), and are capable of solving complex engineering problems, communicating effectively with technical and non-technical audiences, and demonstrating sound and ethical judgment (Outcomes 1, 3, and 4). The program needs to reverse a downward trend in the areas of applying engineering design (Outcome 2), conducting appropriate experimentation (Outcome 6), and acquiring new knowledge (Outcome 7).

5. **Based on the findings, did the faculty make any recommendations for changes to improve student achievement of the program student learning outcomes? Please describe the recommended action, what improvement in student learning the program hopes to see with this change, the proposed timeline, and how the program will know if the change has worked. If no recommendations for changes were made, please explain that decision.** *(750 Characters or less)*

The small size of the CSE program means that one or two below-average students can have a profound negative impact on assessment results. The faculty needs to collect more data over the next two years, and if the downward trends continue, then appropriate action needs to be decided and acted upon.

PROGRAM IMPROVEMENTS AND ASSESSING IMPACT ON STUDENT LEARNING

6. **In the past academic year, how did your program use the results of previous assessment cycles to make changes intended to improve student achievement of the program student learning outcomes? Please check all that apply.**
   ☐ Course curriculum changes
   ☐ Course prerequisite changes
   ☐ Changes in teaching methods
   ☐ Changes in advising
   ☐ Degree requirement changes
   ☐ Degree course sequencing
   ☐ Course enrollment changes (e.g., course capacity, grading structure [pass/fail, A-F])
   ☐ Changes in program policies/procedures
   ☐ Changes to Program Student Learning Outcomes (PSLOs)
   ☐ College-wide initiatives (e.g., High Impact Practices)
   ☐ Faculty, staff, student development

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☒Other

☐ No changes were implemented in AY21.

If you checked "Other" above, please describe. *(100 characters or less)*
We continued to monitor the impact of creating and requiring CSDE A101 on CSCE A201 retention.

7. **Do you have any information about how well these or other past improvements are working? Are they achieving their intended goals? Please include any data or assessment results that help you demonstrate this.** *(750 characters or less)*
During the six semesters prior to adding CSCE A101, the student pass rate (A, B, or C) in CSCE A201 was 45% After adding the CSCE A101 prerequisite, pass rates in CSCE A201 improved to 73% for the Spring 2021 semester. While it would be premature to conclude thar adding CSCE A101 was the cause for this improvement, the numbers are encouraging.

8. Programs are not required to respond to question #8 below for their report due on October 15, 2021. Question #8 will be required for the next round and moving forward.

9. **Do you have any examples of post-graduate success you want to highlight? For example, major scholarships, the percent of students who pass licensure examinations, the percent of students accepted to graduate programs, the percent in post-graduation employment in the field or a related field.** *(750 characters or less)*

DEAN SECTION (Due to the program on January 15)

1. **Based on the program's responses above, what guidance and support do you have for the program moving forward? Is there a particular area the program should focus on?** *(750 characters or less)*
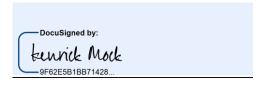The disappointing results for Outcomes 2, 6 and 7 are acknowledged as a normal part of the assessment process. We are confident that the CS&E faculty will discuss and implement creative ways to improve these outcomes as part of its ongoing continuous improvement process. We also acknowledge that CSE is a small program, which makes trends in the data more difficult to track and interpret, and support the faculty plan to collect more data.

2. **Is there something the program is doing particularly well in terms of its processes for the assessment and improvement of student learning, including the closing of equity gaps, that might serve as a model for other programs? If yes, please explain. You may skip this question.** *(750 characters or less)*
The program is commended for taking the step of adding CSCE A101 to the curriculum, which was intended to improve the pass rate for CSCE A201. The data seem to bear out that that new course is having the intended effect.

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Dean's signature:

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kenrick Mock

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Date: 1/28/2022