Academic Affairs
University of Alaska Anchorage

3211 Providence Drive
Anchorage, AK 99508-4614
907.786.1050

REPORT ON AY2022-2023 ACADEMIC ASSESSMENT

Submission date: 11/15/2023

Assessment Plan covered in the report: Computer Systems Engineering BS

College: College of Engineering

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

Submitted by: Frank Witmer, Associate Professor and Chair of CS&E, fwitmer@alaska.edu

After responding to the questions below, the program should email this form to the dean, with a copy to the appropriate community campus director(s) if the program is delivered on a community campus.

1. **Please list and number the Program Student Learning Outcomes your program assessed in AY23. For each outcome, indicate one of the following: Exceeded faculty expectations, Met faculty expectations, or Did not meet faculty expectations.**

   Example: 1. Communicate effectively in a variety of contexts and formats – Exceeded faculty expectations; 2. Adopt critical perspectives for understanding the forces of globalization and diversity – Met faculty expectations.

   We assessed all seven Program Student Learning Outcomes for AY2022-23. Faculty expectations are met when at least 75% of students are rated Satisfactory or Excellent; expectations are exceeded when at least 90% of students are rated Satisfactory or Excellent.

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

   65.6%: Did not meet 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.

   92.9%: Exceeded 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.

   100%: Exceeded 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.

33.3%: Did not meet 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.

71.4%: Did not meet faculty expectations.

Outcome 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

72.7%: Did not meet faculty expectations.

Outcome 7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

81.8%: Met faculty expectations.

2. **Describe your assessment process in AY23 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.** ***(1000 words or less)***

   Faculty teaching the below courses evaluate students based on established rubrics for each outcome. Students are evaluated as Poor, Developing, Satisfactory, or Excellent. Results are entered into a master spreadsheet for analysis and discussion by department faculty members.

   Outcome 1: CSCE A342 (Digital Circuits Design) and CSCE A470 (Capstone)

   Outcome 2: CSCE A470

   Outcome 3: CSCE A470

   Outcome 4: CSCE A465 (Computer and Network Security)

   Outcome 5: CSCE A470

   Outcome 6: CSCE A448 (Computer Architecture) and CSCE A470

   Outcome 7: CSCE A448 and CSCE A470

3. **What are the findings and what do they tell the faculty about student learning in your program?** ***(1000 words or less)***

   The prior academic year, AY2021-22, had 0-4 CSE students enrolled in the key outcome classes which made assessment very difficult. For AY 2022-23, enrollment numbers increased for the assessment courses, though numbers are still small: 4-9 students for Outcome 1, but only 3-4 students for Outcomes 2-7. Though an improvement, this still makes it difficult to draw firm

conclusions from the data.

Given the dearth of data collected during AY2021-22 and continued low numbers, we evaluated the student learning outcomes with an eye towards historical trends. Based on the last 5 years of annual assessment data (since AY2018-19), we concluded that Outcomes 1 and 6 were weak enough to merit additional discussion.

4. **Based on the findings, did the faculty make any recommendations for changes to improve student achievement of the Program Student Learning Outcomes?** Yes

    i. **Please describe the recommended action(s), what improvements in student learning the program hopes to see, the proposed timeline, and how the program will know if the change(s) has worked. If no recommendations for changes were made, please explain that decision.** ***(1000 words or less)***

    For Outcome 1, many of the Poor scores for AY2022-23 are due to students not submitting the assignment, some of those effectively dropped the course. For those that did submit the assignment, assessments were much stronger. The department agreed that the assessment data should be more reflective of students actively engaged with the course content. This outcome should continue to be monitored.

    For Outcome 6, the department agreed to add an engineering experimentation problem that includes probability and statistics to CSCE A448 and to use it for evaluation purposes.

    We hope that by making these changes, student assessments for these outcomes will improve in 1-2 years.

5. **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

☒Other

☐No changes were implemented in AY23. *(If no options above were selected)*

If you checked "Other" above, please describe. *(100 words or less)*
Minor changes to course content.

6. **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. *(1000 words or less)***

   In the prior assessment report, the department agreed to add a research survey/review assignment for CSCE A342. The goal of this change was to improve student performance for Outcome 7. Based on the latest assessment data reported above, the change appears to be working, but we will continue to monitor this outcome in case additional changes are required

   For AY2020-21, we revised the introductory sequence to require a new class, CSCE A101 Introduction to Computer Science, as a prerequisite to CSCE A201. The goal was to reduce the high Drop/Fail/Withdraw (DFW) rates for CSCE A201 and improve student programming skills throughout the program. The following table shows DFW rates have improved (decreased) for CSCE A201 since implementing these changes in Fall 2020:

   Term DFW

   SP17 48%

   FA17 52%

   SP18 44%

   FA18 47%

   SP19 45%

   FA19 59%

   SP20 51%

   FA20 38%

   SP21 27%

   FA21 27%

   SP22 36%

   FA22 24%

   SP23 33%

DEAN SECTION (Due to the program on January 15)

After completing the Dean Section and signing it, the dean should email this form to the program, and copy uaa_oaa@alaska.edu for posting. If the program is delivered on one or more community campus, the dean should consult with the appropriate community campus director(s) on the response and copy the appropriate community campus director(s) when emailing the response to the program.

1. **Based on the program's responses above, what guidance and support do you have for the program moving forward? *(200 words or less)***

   We acknowledge that the program is dealing with low enrollments, which can make interpreting data difficult. However, the disappointing results for Outcomes 1 and 6 have persisted. The faculty have proposed corrective action for Outcome 6, but is is unclear what they intend to do for Outcome 1 beyond continuing to monitor. If many of the poor scores were caused by the artifact of students not turning in a particular assignment, then it might make sense to choose a different assessment tool that is more reflective of students who actively engage in the program (perhaps in the different class), or to change how the tool is assessed.

2. **Discuss what the program is doing particularly well in terms of its processes for the assessment and improvement of student learning, for example, the use of a common rubric or prompt, a signature assignment, etc. *(200 words or less)***

   We agree that the data presented for CSCE A101 in terms of CSCE A201 pass rates are encouraging. The department is also commended for following through with the process for better documentation of meetings that was implemented in response to ABET feedback from the last academic year.

Dean's signature:  **Date:** 1/15/2024