UAA Academic Affairs
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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: Select date.

Submitted by: Jens Munk, Professor Electrical Engineering, jmunk2@alaska.edu

Program(s) covered in this report: Electrical Engineering

College: College of Engineering

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

Specialized accrediting agency (if applicable): ABET

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)*

   In a sense all of our courses are intended to develop the knowledge and skills necessary to be successful engineers. Our courses generally build on one another, and having a strong foundation is essential to the long term success of our students. We

also encourage students to collaborate, both inside and outside of the classroom. These collaborations occur informally in some classes, and formally in others, most specifically senior design. Upon graduation we would expect our students to have a solid foundation in electrical engineering, be able to communicate effectively, and work well in team based environments.

- 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 XNo**
  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 xNo**
  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.**

<exceeded expectations* - met expectations - did not meet expectations**>

Assessment Schedule	F	S	F/S	F/S
Outcomes	EE 203 X/4.0	EE 438 X/4.0	Exit Survey X/5.0	FE Exam difference from the natl avg X/15
1. ability to identify, formulate, and solve complex engineering problems	2.68		4.22*	-0.45**
2. ability to apply engineering design to produce solutions that meet specific needs		3.21*	4.17*	
3. ability to communicate effectively with a range of audiences		3.31*	4.00*	
4. ability to recognize ethical and professional responsibilities in engineering situations			3.78*	0.30*

5. Ability to function effectively on a team			4.00*	
			4.33*	
		3.19*	4.33*	

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)*

Program Student Learning Outcomes are assessed in multiple ways.

a) Some assessments are carried out in individual classes by faculty. The assessment methods and data collection are recorded in the Annual PLSO Assessment Report, with samples of student work assessed. The results of these assessments are summarized in the prior table. Typically, every outcome is assessed in multiple classes each semester. Every Outcome is assessed at least once every two years in a course where objective observations can be made. In the 2020-2021 AY, several assessments were not conducted due to changes in class delivery or in one case, miscommunication between the Adjunct faculty member delivering the course and the Assessment coordinator.

b) Data from the NCEES Fundamentals of Engineering Exam are compiled for the calendar year (2020) and presented as an aggregate of UAA EE's who took the exam, and their overall performance as compared to the national average of all others who took the FE Exam. These results are presented as a deviation from the National Average. Results above the national average are considered to be meeting or exceeding expectations. Category results below the national average are considered not meeting expectations and are grounds for continued discussion among the faculty. Typically, the number of EE's taking the FE exam annually are relatively small and the results are not statistically representative but can serve as a gauge of tracking long term trends in student success.

c) A Graduate Exit Survey is given during the EE Capstone design course wherein we ask the students to rate themselves on mastery of the seven Student Learning Outcomes on a scale of 1-5 and how the institution did in instructing students on the same 7 SLOs. Trends in student performance and opinion of the quality of the institution (instruction delivery, quality of advising, quality of laboratory space, etc.) are tracked and marked for discussion by the Faculty

group.

d) Discussion of the PSLOs and assessments are held at an annual EE faculty meeting to discuss results, observed trends, and if curriculum changes should be made. Discussions are continued with an EE Advisory Board made up of former graduates, professionals in the Anchorage electrical engineering community, and former EE faculty members.

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

Typically, Outcome 1 is assessed in a lower level class (EE A203) and an upper level (EE A471) course. This allows us to track improvement as students advance from a sophomore level class to a senior level course. We typically see a higher assessed performance as seniors, which would indicate that students are developing as they progress through the program.

The Senior Capstone Design course is used for several outcome assessments, with Faculty rating the students during their final formal project presentations. These are typically above average, and oftentimes excellent. This points to satisfactory development of the students with respect to the outcomes being assessed.

The FE exam results, while not statistically significant due to the low number of students who take the exam, does still give us a data point for areas that are in need of attention. For instance, in prior years assessments we noted a below average performance in Controls and Probability and Statistics. This prompted us to make Automatic Controls (EE A471) a required course. In consultation with the other Engineering Programs, problems with achievement in Probability and Statistics were noticed, which prompted changes to the Engineering Statistics course (ES 302). Observed performance on the FE Exam improved after this change went into effect. An observed deficiency in outcome 4 led to the program requiring PHIL A305 Professional Ethics as one of the EE students GERs.
Currently, the tracking of FE results for EE students exhibits what we would characterize as "noise" in the data points. Sometimes a given category is up, the next cycle it is down, thus no long term trends can be extracted from the data.

Graduate Exit surveys are remarkably constant in student assessment of their own performance and their rating of the institutional performance.

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)*

Outcomes assessed in the 2020-2021 cycle have led to no recommended changes of courses of action. During the 2021-2022 assessment cycle, every outcome has been scheduled to be assessed in at least two courses. This provides quantitative assessment data as in the 2020-2021 cycle, some outcomes were only assessed via the Graduate Exit Survey which is qualitative in nature. Continued monitoring of all seven outcomes is scheduled for each AY.

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

☐ Other

xNo changes were implemented in AY21.

If you checked "Other" above, please describe. *(100 characters or less)*

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)*

   Performance on the FE Exam category in Ethics increased noticeably after the requirement of PHIL A305 Professional Ethics as a GER.

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)

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? Is there a particular area the program should focus on?** *(750 characters or less)*

   We had earlier expressed concern that the table on p. 4 shows that some SLOs have been assessed by indirect methods only (Senior Exit Survey), but the program faculty assured us that they are in the process of collecting direct assessment data for all outcomes. The program seems to be on track to complete its ABET self-study for our reaffirmation of accreditation visit in Fall 2022.

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)*

Dean's signature:

DocuSigned by:
Kenrick Mock
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Date: 2/7/2022