

7/31/2024

## ACADEMIC PROGRAM REVIEW REPORT AY2023-24

**Program(s) in the review:** BS/MS Civil Engineering

**Specialized Accrediting Agency (if applicable):** Engineering Accreditation Commission of ABET

**Campuses where the program is delivered:**  Anchorage  KOD  KPC  MSC  PWSC

**Year of last review:** AY20

**Final decision from last review:** Continuation

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### PROGRAM SECTION (Due on March 1)

*The program review committee chair and committee members are assigned by the dean. All program faculty should be included in the review process, including faculty on the community campuses. After completing the Program Section below, the program review committee chair will enter their name and date, and email this form to the dean, copying all committee members. If the program is fully delivered on a community campus, copy the appropriate community campus director(s). The program review committee chair's name and date lines are at the end of the Program Section.*

#### Program Review Committee:

Scott Hamel, PE, PhD - Department Chair and Program Committee Chair

Utpal Dutta, PhD - Committee Member

#### 1. Demonstrate that the program has responded to previous recommendations.

**BS Recommendation 1:** *Establish a course rotation that both reduces the number of courses offered each semester and ensures content depth in each category required for accreditation.*

**How do you know the recommendation has been successfully achieved? (2500 characters or less)**

In AY2017-18, the department operated with 11 full-time faculty members (10 tenure-track), plus a part-time tenured faculty who was also part-time Associate Dean, and one adjunct. This number gradually reduced until AY22-23 when the department operated with only 7 full-time faculty members and no adjuncts. All the courses in the BSCE degree were covered.

**Actions taken to date (2500 characters or less)**

Several changes have been undertaken to streamline the course lineup, both in terms of degree requirements, and course scheduling.

Degree Requirement Changes - In AY21-22, the 3-credit "Engineering Graphics" course was split into two courses, a 2 credit course offered every semester that is now shared with the ME department, and a 1 credit course offered only in the Spring. This change helped both the

student's flow through the program, provided the right skills at the right time, and reduced teaching load.

In AY22-23, the BSCE degree removed the requirement for Physics 212. While this did not affect the CE teaching load, it opened more flexibility for students to take CE classes when offered.

In terms of course scheduling, the frequency of the Arctic Engineering course has been reduced. In addition, several courses that previously offered multiple sections, such as Mechanics of Materials and Fluid Mechanics have been reduced to one section per semester. In some cases, this was done by removing the Civil Engineering faculty member from the rotation.

**Evidence of success to date (2500 characters or less)**

Coupled with effective advising, the number of students that have gotten "stuck" without the right course offerings have been reduced or eliminated. As noted above, the program has continued to operate and produce high-quality graduates with far less faculty.

**BS Recommendation 2:** *To ensure a more efficient use of resources, the program should work with Geomatics to revise the CE curriculum to use the regularly offered GEO A156 course rather than a special non-majors' course.*

**How do you know the recommendation has been successfully achieved? (2500 characters or less)**

This recommendation has not been achieved.

**Actions taken to date (2500 characters or less)**

In the AY20-21 realignment of the Engineering Graphics course, the course outcomes in several adjacent courses were reviewed and aligned to create a complimentary sequence of courses that each build on each other. This sequence starts with the 2-credit Engineering Graphics, which leads to the 3-credit Surveying course (GEO A155), then the 1-credit CE A201 - Introduction to Civil Engineering, and finally the 1-credit Digital Terrain Modeling software course on "Civil3D".

As part of this conversation, it was discussed whether the GEO A155 course could be rolled into the GEO A156, but it was decided that the material for the majors and non-majors was too different.

**Evidence of success to date (2500 characters or less)**

There has been positive feedback from students in course assessment surveys about the new sequence. In addition, Geomatics has been able to expand the material in GEO A155 to include GIS components, which has helped in later CE courses in Water Resources. Not enough time has passed to see the effects of this change on students in the Capstone course, which is when we survey the students more and will gain more feedback.

**MS Recommendation 1:** *The program must reduce costs. It should decrease the number of courses offered each semester to increase course capacity. It should*

***also realign resources to help teach the undergraduate courses in CE, ES, or ENG.***

**How do you know the recommendation has been successfully achieved? (2500 characters or less)**

As noted above, the number of faculty has been drastically reduced from twelve in 2017-18 to seven in 2022-23. The department effectively dropped to six members (plus an adjunct) briefly in fall 2023 when one member was put on a non-teaching temporary assignment. One new hire was added in 2024. This is by far the largest reduction of any department in the College of Engineering.

**Actions taken to date (2500 characters or less)**

With the reduction in faculty, the number of courses offered at the graduate level has been reduced significantly. Many Arctic Engineering courses have been effectively eliminated, and the frequency of Geotechnical and Water Resource courses has been reduced.

**Evidence of success to date (2500 characters or less)**

Despite the dramatic loss of faculty, the student credit hour to full-time equivalent faculty (SCH/FTEF) has actually increased from an average of 104 in 2019 & 2020 to an average of 119 in 2021 - 2023. This is a result of much larger class sizes in the Water Resources and Structural graduate classes thanks to an increased demand in the industry and reputation of the UAA program in these areas. In fact, these productivity numbers are actually higher than those reported because the department includes an FTE that does not contribute meaningfully to the SCH totals.

***MS Recommendation 2: The program should also examine the MSCE curriculum to see if the actions from Program Prioritization still make sense. For example, courses in the environmental emphasis area have not been taught for several years due to the loss of faculty. One potential strategy to maintain the emphasis is to supplement instruction with delivery from UAF.***

**How do you know the recommendation has been successfully achieved? (2500 characters or less)**

Graduate courses have been shared via synchronous and asynchronous delivery between UAA and UAF for several years. Anecdotally, many of the UAA courses over the past few years have had a small number of students from UAF (including some from UAF Mechanical Engineering graduate program). This exchange is hampered by the small number of UAF MSCE students.

**Actions taken to date (2500 characters or less)**

Courses have been shared regularly via distance with UAF since approximately 2020. The department Chairs began coordinating course sharing in 2021. A joint advertisement, which includes all the graduate courses offered in an AY has been sent to engineering societies since

AY21-22. In addition, several course offerings have been re-sequenced to allow alternating offerings between UAA and UAF. These include courses in all five of the CE disciplines.

**Evidence of success to date (2500 characters or less)**

As noted, courses have been shared and students from both UAA and UAF have enrolled in courses at the opposite institution. Students have been happy with the additional offerings that are made available to them and the corresponding effect on speeding up their graduation. In addition, several undergraduate courses have been fully shared between the two institutions to make up for faculty absence, including in the areas of Project Management, Engineering Science, and Environmental Engineering. A detailed study has not been conducted to see how many students have taken courses at the opposite institution.

***BS/MS Recommendation 1: Continue to seek methods of continuous improvement, collaborate with UAF to best utilize our respective expertise, and operate in a cost-effective manner. Research is highly valued. The College will be having workload discussions to determine how to continue and enhance research in its situation of fiscal pressure.***

**How do you know the recommendation has been successfully achieved? (2500 characters or less)**

This is a fairly vague recommendation and it's difficult to determine exactly what "success" means for these statements.

**Actions taken to date (2500 characters or less)**

Following a search in AY22-23, an Assistant Professor in the Environmental Engineering was hired. His previous position was as a research faculty and Post-doc at UAF. His history and ties to UAF should encourage collaborative research between the two Universities. In addition, in 2022, the CE department hired a grant-funded Post-Doctoral Research Associate in structural engineering. This faculty member enables increased research production, even amid heavy teaching loads.

**Evidence of success to date (2500 characters or less)**

The Civil Engineering department, despite significant loss of faculty, has continued to be a leader in research productivity, in both the College and the University. Faculty members have won external and internal research awards, published papers, and graduated students throughout the review period.

- 2. Demonstrate the centrality of the program to the mission, needs, and purposes of the university and the college/community campus. Include how the program is integrating (or planning to integrate) intentionally designed opportunities for students to develop the four core competencies**

**(Effective Communication; Creative and Critical Thinking; Intercultural Fluency; and Personal, Professional, & Community Responsibility). (2500 characters or less)**

A write-in crusade of prospective students and engineer employers led to the creation of the BS Civil Engineering (BSCE) program at UAA in 1981. The BSCE program was created by the community and serves to meet the communities' needs for highly qualified civil engineers, therefore directly supporting UAA's mission "...UAA is committed to serving the higher education needs of the state, its communities and its diverse peoples..." The BSCE program also directly aligns with the mission of the College of Engineering "...to provide high-quality, hands-on undergraduate and graduate engineering education to Alaskan students, to meet industry's need for well-trained engineers and to provide continued professional training..."

The civil engineering profession is critical to the development of Alaska infrastructure, and BSCE education is necessary to its practice. As a result, civil and environmental engineers (a CE sub-discipline) are in high demand in Alaska. The Alaska Department of Labor projects that the number of Civil and Environmental Engineers in Alaska will increase 5%, from 1309 to 1373 between 2020 and 2030. The number of annual openings in these fields is more than 100, of which the BSCE program at UAA is currently meeting less than 20%.

Based on exit survey data, over 80% of UAA BSCE taking the senior design class students get at least a job offer before graduation, and about 20% choose to attend graduate schools. Engineering companies are mainly based in Anchorage and many employ part-time BSCE students that contribute valuable career training during their study at UAA. More than 75% of UAA BSCE Seniors report completing an engineering internship while at UAA.

Beyond introductory and GER courses, the primary method that the BSCE program uses to develop the four core competencies is the Capstone sequence, which includes a 1-credit course called "Project Planning" and a subsequent 3-credit Capstone course. These courses have a variety of lectures, assignments, projects, and presentations that specifically target all four core competencies, all of which align easily with the goals, program outcomes, and professional necessities of becoming a professional in the civil engineering industry.

**3. Demonstrate program quality and improvement through assessment and other indicators.**

**a. Program Student Learning Outcomes Assessment and Improvement Process and Actions**

**i. BS Civil Engineering**

- *1) Identify, formulate, and solve complex civil engineering problems by applying principles of engineering, science, and mathematics; 2) Apply civil engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as cold regions, global, cultural, social, environmental, and economic factors; 3) Communicate effectively with a range of audiences; 4) 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; 5) Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet*

*objectives; 6) Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; 7) Acquire and apply new knowledge as needed, using appropriate learning strategies.*

***Describe your key findings for these outcomes. (3500 characters or less)***

As part of the ABET accreditation process, the department performs regular assessment of the program outcomes. As a result of the fall 2022 ABET visit, the assessment program was heavily revised and then the new system was performed for the AY2022-23. This plan uses 32 course-level artifacts to assess 14 performance indicators to evaluate the seven outcomes listed above. The BSCE program received accreditation from ABET in 2023. Details of these assessments can be found in the appropriate ABET reports.

The department reviewed the program outcome assessment results on May 11th, 2023. It was decided that, in general, since these are the first data points of a new method, that no final conclusions could be drawn.

That said, most of the performance indicators (11 of 14) indicate satisfactory performance by the students. There were two Performance Indicators in which the percent satisfactory was low enough to warrant close monitoring going forward. And there was one Performance Indicator for which the assessment results indicate immediate action is necessary to improve the achievement rate. This was Performance Indicator 4a, which is the ability to describe the ethical and professional responsibilities related to an engineering project.

***Describe actions taken to improve student learning for these outcomes. (3500 characters or less)***

In addition to the broader program level outcomes, ABET requires more granular course level outcome assessments. These assessments initiated a number of course-level actions designed to improve outcomes specific to particular courses.

Besides an additional round of assessments in 2024, several actions were taken to improve the student success in Performance Indicator 4a. In particular, additional lectures, case studies and assignments will be implemented in CE A437 – Project Planning class in AY23-24.

Previous to the rigorous ABET assessments, other changes to the program were made due to feedback from employers and alumni. One of these was the separation of the Civil3D class, so that it could be implemented later in the program. Another program change was the elimination of the requirement of Physics 212. Coupled with this credit requirement was an increase in the credits applied to CE A351 - Structural Analysis (from 3 credits to 4). This is the class with the lowest pass rate in the program, and could use additional credit to cover the material.

***Describe evidence that these actions are working. (3500 characters or less)***

It is too early to tell if the measures that have been implemented are effective. However, a significant number of students have changed their catalog year to 23-24 in order to take advantage of the elimination of Physics 212, so this is a popular change.

ii. **MS Civil Engineering**

- *1) An ability to use advanced methods of analysis; 2) An ability to understand advanced civil engineering theory; 3) An ability to conduct advanced civil engineering research; 4) An ability to apply advanced engineering theory to the design of civil engineering systems; and 5) An ability to work effectively within the management framework of organizations responsible for the practice of engineering.*

***Describe your key findings for these outcomes. (3500 characters or less)***

Assessment of the MSCE program outcomes is guided by the MSCE Assessment Plan (2017), which describes evaluating the program outcomes using 1) the Advisory Board, 2) Alumni Surveys, 3) Employer Surveys, and 4) Evaluation of MS Thesis, Projects, and Exams. With the faculty and staff reductions, these assessments have not occurred as frequently as suggested. However, methods 1) and 4) have been conducted regularly, and 2) and 3) intermittently. In general, the assessment methods indicate that graduates of the MSCE program are satisfactorily achieving the learning outcomes.

***Describe actions taken to improve student learning for these outcomes. Programs may enter "See above" if there is a significant overlap of outcomes. (3500 characters or less)***

No significant changes have been made within the period. However, immediately prior to the review period, four actions were taken, the MS in Arctic Engineering was converted to an MSCE with a concentration in Arctic, five other "concentrations" were added to the MSCE, the "Exam Option" was added in addition to the Thesis and Project options, and the "fast-track" option was added to allow students to pursue both a BSCE and MSCE at the same time.

***Describe evidence that these actions are working. Programs may enter "See above" if there is a significant overlap of outcomes. (3500 characters or less)***

The number of MS students with interest in both the exam option, the fast-track option, and earning a degree with a concentration has increased markedly. In particular, the number of students actively taking classes in Structural Engineering has more than doubled. This has made up for the decline in Environmental students (due to a lack of faculty in this area), as is evidenced by steady trends in the Student Credit Hour trends. This increase is driven by industry demand and a favorable reputation in the community.

- b. **Demonstrate program quality and improvement through other means, for example, maintaining specialized accreditation, using guidance from advisory boards/councils, responding to community partners and local needs, maintaining currency of the curriculum, implementing innovative program design, intentionally integrating high-impact teaching and learning practices into the program, and meeting indications of quality in distance education, such as the C-RAC Standards. (3500 characters or less)**

The BSCE program is accredited by ABET. It was re-accredited in 2023. In addition, the program maintains an active Advisory Board with roughly 20 members. The advisory council has provided valuable curriculum guidance in the past, and is currently involved in new efforts to recruit more students.

**4. Demonstrate student success and the closing of equity gaps.**

- a. Analyze and respond to the disaggregated data in the data sheet for your program. Provide clarifications or explanations for any positive or negative trends indicated by the data, and discuss what you are doing to close any equity gaps. The Student Success program review metrics are Junior Graduation Rate, Associate Graduation Rate, Semesters to Degree – Graduate Programs, and Course Pass Rates by Course Level. (3500 characters or less)**

Most of the Student Success metrics are relatively constant across the period, with some variation, which would be expected in programs with small numbers. A few of the indicators have temporary declines in 2022, which was the graduating class most affected by COVID. The most important metric for the program is the Upper Division Undergraduate Course Pass rate, which is extremely steady, and above 90%. This is the metric that the department has the most control over given that almost all the CE courses are upper division. Semesters to graduation for the MSCE are also relatively constant across the period.

- b. Numerous US universities, and a number of programs across UAA, have holistically evaluated their programs and courses to look for unintended barriers to student success. For example, the Purdue IMPACT (Instruction Matters: Purdue Academic Course Transformation) effort between 2011 and 2018 resulted in 325 courses being redesigned to incorporate research-based strategies known to increase student outcomes, while maintaining academic quality and rigor. Other efforts have involved course sequencing and scheduling, resulting in improved success even for [graduate students](#). Please consider your program's graduation rate, course pass rates, and similar data sources to reflect on any barriers to students moving through the curriculum, and describe what steps you have taken (or are planning to take) for possible redesign of gateway courses, course sequence changes, course scheduling, or similar efforts. (3500 characters or less)**

The Bachelors of Science of Civil Engineering is a mature program with closely regulated curriculum that aligns with other programs nationally. Many of the courses are direct prerequisites for subsequent courses and have specific course learning outcomes, which does not leave a great deal of flexibility in modifying the program. In addition, the massive reduction in faculty and associated increase in teaching loads leaves little time for program modifications. However, the UAA BSCE graduation rates and course pass rates are at or above similar measures nationally suggesting that barriers to student success are already low. That said, in an attempt to improve student success, the overall credits requirement for the degree was reduced in 2023 from 132 to 128 by eliminating Physics 212, a course that covers material unnecessary for Civil Engineers. In addition, a number of courses were rescheduled in AY2022-23 in order to align each cohort's schedules onto MW or TR in order to encourage in-person attendance, because in-person attendance has been shown improve student success.

- c. Provide evidence of the overall success of students in the program. For example, you might talk about the percent of students in post-graduation employment in the field or a related field, the percent of students who go on to graduate school or other post-graduation training,**



**and/or the percent of students who pass licensure examinations. You might also give examples of students who have been selected for major scholarships or other competitive opportunities. [Please do not use personally identifiable information.] (3500 characters or less)**

The number of BSCE program graduates that are employed in the Civil Engineering workforce is close to 100%. In the last 5 years, approximately 70% of enrolled students that took the Fundamentals of Engineering (FE) Exam passed, in line with the national average. In addition, in the last year, 7 out of 10 graduates that have taken the Professional Engineers (PE) exam have passed, far higher than the national average. And finally, the BSCE program has several graduates that have recently completed PhDs at prominent institutions.

**5. Demonstrate demand for the program.**

- a. Analyze and respond to the data in the data sheet for your program. Provide clarifications or explanations for any positive or negative trends indicated by the data, and discuss what you are doing to improve. The Demand program review metrics are Ratio of Out-of-Discipline Credit Hours to Total Credit Hours, Number of Program Graduates Who Continue Education, and Number of Program Graduates Who Return to UAA to Pursue an Additional Program. (3500 characters or less)**

All of the "demand" statistics in the data have remained relatively constant over the last 5 years, which is consistent with a technical degree that targets a particular profession. However, the civil engineering industry is begging for more graduates, constantly requesting access to graduates and asking the department to post job advertisements. The March 2024 UAA STEM Career Fair was organized into two categories: "Civil Engineering" (20 companies) and "Engineering" (17 companies). And 4 of the companies in the latter category predominately hire Civil Engineers. The tally of jobs available from the companies at the Fair numbered in the scores, while the number of 2024 graduates is less than a dozen. The UAA BSCE enjoys a relatively good reputation within the local engineering community and the industry desires more graduates. The CE Advisory board and local industry have actively sought to assist the department in recruiting more students, including offering scholarships.

**6. Demonstrate program productivity and efficiency.**

**Analyze and respond to the data in the data sheet for your program. Provide clarifications or explanations for any positive or negative trends indicated by the data, and discuss what you are doing to improve. The Productivity and Efficiency program review metrics are Five Year Degree and/or Certificate Awards Trend, Student Credit Hours per Full-Time Equivalent Faculty, and Full-Time Equivalent Student per Full-Time Equivalent Faculty. (3500 characters or less)**

All of the productivity data for the BSCE have trended steadily downward and landed a roughly half of what they were in 2019, while those at the MSCE level have remained relatively constant. As noted above, there has been a large reduction in faculty over this period, but the drop in BS enrollment has been larger. It is believed that there was a steep drop in entrants to the program starting around 2019, but it took several years for this decline to be revealed in student credit hours as students already in the program moved through and graduated (since most credit hours are at

the junior and senior levels). There are many reasons for this decline. COVID certainly had an effect. It is believed that the very public UA budget cuts sent potential students out of state. And finally, it is believed that cultural influences and K12 educational programs have pushed potential Civil Engineering students into other related areas, such as computer science and mechanical engineering.

Starting in the summer of 2023, the department has begun an aggressive recruitment campaign, starting in the MatSu and Anchorage areas. This includes visits with Anchorage high school principals, presentations in Anchorage high schools and at STEM events, scholarship offers, and a high school / middle school model bridge building competition in which engineers from industry visited more than 30 classrooms.

**Optional: Discuss the extent to which, if any, extramural funding supports students, equipment, and faculty in the program. (3000 characters or less)**

- 7. Assess program distinctiveness, as well as any duplication resulting from the existence of a similar program or programs elsewhere in the University of Alaska System. Is duplication justified, and, if so, why? How are you coordinating with UAA's community campuses and the other universities in the system? (2500 characters or less)**

The UAA Civil Engineering program exists alongside BSCE and MSCE degrees at UAF. The two programs are both necessary and complementary. Both programs are necessary because students are looking for different college experiences (urban vs rural, etc), and the combined total of graduates from both programs is not yet meeting the needs of the State. They are complementary because they have strengths in different discipline areas and the corresponding graduate-level courses are shared. Both departments have strong research programs, though with different focuses. UAA has strengths in coastal engineering, transportation, permafrost, and residential structural and seismic design and testing. In addition, the UAA program has an exceptional Capstone program that is led by professional mentors from industry. Being in the geographic center of the engineering industry allows this collaboration, as well as providing easy access to internships and part-time jobs for students.

- 8. Assess the strengths of your program and propose one or two action steps to address areas that need improvement. (4000 characters or less)**

As noted above, the BSCE program has an exceptional two-semester Capstone Design course sequence that is highly interactive with the civil engineering industry. The MSCE classes are well-respected and offered part-time in the evenings, a particular advantage for those working in industry in Anchorage. In addition, the department has particularly strong externally funded research program.

While there are likely curricular and administrative improvements that could be made, clearly, the primary area in need of improvement in our program is the ability to recruit and retain students. The number of faculty cannot shrink any further without disrupting the program, and currently workloads have stretched the faculty thin. As such, and given the demand in Alaska, the clear choice is to pursue every avenue to increase enrollment. Once freshmen enrollments have

increased (change of majors are already up significantly this year), then additional improvement can be made in nurturing the cohorts and improving retention.

*After completing the Program Section above, the program review committee chair should enter their name, date, and email this form to the dean, copying the committee members. If the program is fully delivered on a community campus, copy the appropriate community campus director(s).*

**Committee chair first name last name:** Scott Hamel

**Date:** 3/19/2024

END OF PROGRAM SECTION

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### DEAN SECTION (Due on April 1)

*If the program is fully delivered on one or more community campus, the dean should consult with the director(s) of the campus. After completing the Dean Section below and entering their name, the dean should email this form to the committee. If the program is delivered on a community campus, copy the appropriate community campus director(s). The program has one week to provide an optional response to the Dean Section using the Program Optional Response Section of this form.*

#### 1. Evaluation of Progress on Previous Recommendations

**For each recommendation from the last program review, indicate if the recommendation has been met or has not been met and provide commendations and guidance as appropriate. (2500 characters or less for each recommendation)**

***BS Recommendation 1: Establish a course rotation that both reduces the number of courses offered each semester and ensures content depth in each category required for accreditation.***

Recommendation has been met.

We concur that the Department has realistically tracked its course offerings to its faculty resources as described during the review period. The Department is commended for working with the ME Department to streamline engineering graphics requirements as described, and to navigate a mutually agreeable teaching rotation for shared courses.

***BS Recommendation 2: To ensure a more efficient use of resources, the program should work with Geomatics to revise the CE curriculum to use the regularly offered GEO A156 course rather than a special non-majors' course.*** Recommendation has been met.

As with our review of the Geo Department, we consider that this recommendation has been duly considered, although it was not ultimately adopted. The Department worked with their colleagues in Geo to explore replacing GEO A155 with GEO A156. Both groups of faculty agreed that, although both are introductory geomatics courses, the needs of in-major and out-of-major students are sufficiently different to justify retaining both.

**MS Recommendation 1: The program must reduce costs. It should decrease the number of courses offered each semester to increase course capacity. It should also realign resources to help teach the undergraduate courses in CE, ES, or ENG.** Recommendation has been met.

We concur that the Department has improved the efficiency of the MSCE as described, and as evidenced by an increase in SCH/FTEF during the review period.

**MS Recommendation 2: The program should also examine the MSCE curriculum to see if the actions from Program Prioritization still make sense. For example, courses in the environmental emphasis area have not been taught for several years due to the loss of faculty. One potential strategy to maintain the emphasis is to supplement instruction with delivery from UAF.**

Recommendation has been met.

The Department's collaboration with UAF in terms of sharing graduate courses has provided expanded offerings for students on both campuses. There is room to expand this collaboration, but we do consider it to be a success.

**BS/MS Recommendation 1: Continue to seek methods of continuous improvement, collaborate with UAF to best utilize our respective expertise, and operate in a cost-effective manner. Research is highly valued. The College will be having workload discussions to determine how to continue and enhance research in its situation of fiscal pressure.** Recommendation has been met.

We concur that the Department has maintained its research productivity in the face of shrinking personnel. The recent hire of an Assistant Professor in Environmental Engineering is exciting and is expected to generate new opportunities for courses and research collaborations in an area that is extremely important to Alaska during the next review period.

**Provide your analysis of #2-8 below, based on the data provided and the program's responses above.**

**2. Centrality of the Program. (2000 characters or less)**

We concur that the Department is demonstrating centrality and opportunities for students to develop the UAA Core Competencies, particularly in the culminating experiences that occur in the senior year. The Department is commended for its two-semester Capstone sequence, which solicits real engineering problems locally and requires students to spend an additional semester on planning. The demand for CE graduates in Alaska far exceeds what UAA and UAF are able to produce.

**3. Program Quality and Improvement (2000 characters or less)**

The BSCE program has appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained, per criteria required by ABET for its accreditation. The program was recently re-accredited by ABET.

**4. Student Success and the Closing of Equity Gaps (2000 characters or less)**

We concur with the Department's conclusion that its student success metrics have remained relatively constant, and that COVID provided a particular challenge during the review period. The Department is commended for reducing the credits required for the BSCE degree to something

more in line with the national average for baccalaureate engineering programs (which is around 128).

**5. Demand (2000 characters or less)**

The Department correctly points out that demand for BSCE graduates in Alaska far exceeds what UAA and UAF are able to supply. This year, the Department started working with ASD and its Advisory Board to address decreasing enrollments in CE across the state (there is actually a decline in CE enrollments nationwide). It is expected that enrollment will continue to be a major focus in the next review period.

**6. Productivity and Efficiency (2000 characters or less)**

We suspect that the Department's reasoning as to factors contributing to its declining enrollments (COVID, budget cuts to the UA system) are largely contributing factors. In addition, HS enrollments across Alaska have declined. Enrollments in our programs have tracked with national trends: BSME was the largest program in CoEng at a time when ME enrollments were up nationwide, and now CS is the largest at a time when CS enrollments are up nationwide. CE enrollments are unfortunately down nationwide. Whether this is because of K12 culture or due to other factors involving the visibility of certain majors is unclear. We commend the Department's recruiting campaign, which was launched in fall of this year, including its plans to expand model bridge competition, and encourage the department to engage in positive messaging to recruit new students to the profession.

**7. Duplication and Distinctiveness (2000 characters or less)**

We affirm that the combined production of CE grads from both our College and the UAF College of Engineering and Mines is insufficient for the current needs of the state. Both programs primarily serve students within the catchment area of each university, and each program has its own areas of distinction thanks to specialization among the faculty.

**8. Strengths and Ideas for Moving Forward (2000 characters or less)**

We concur that the BSCE and MSCE programs are high-quality programs that serve an essential need for the state. The Department is commended for its unique approach to capstone. We also concur that enrollment is the most pressing challenge for the Department for the next review period.

**Dean's Final Evaluation**

**I commend the program for: (number and list the specific commendations in the narrative box, 2000-character limit)**

The Department is commended for addressing the recommendations from the last round of review, for successfully navigating reaccreditation of the BSCE by ABET, and for its robust assessment and continuous improvement process. The Department is commended for its unique approach to capstone design.

7/31/2024

**I recommend that the program: (number and list the specific recommendations in the narrative box, 2000-character limit)**

Enrollment, particularly in the BSCE, is currently the biggest challenge that the Department faces. It has started to take sensible steps in the form of its recruitment campaign, which involves ASD and industry partners. These efforts should be continued and expanded in the next review period.

**Dean's overall recommendation to the provost:** Continuation -- Program is successfully serving its students and meeting its mission and goals. No immediate changes necessary, other than regular, ongoing program improvements.

**If an Interim Progress Report is proposed, recommended year:** N/A

**If a Follow-up Program Review is proposed, recommended year:** N/A

**Proposed next regular Program Review:** AY2030

*After completing the Dean Section above, the dean should enter their name, date, and email this form to the committee. If the program is fully delivered on a community campus, copy the appropriate community campus director(s). The program has one week to provide an optional response to the Dean Section using the Program Optional Response Section below.*

**Dean first name last name:** Kenrick Mock

**Date:** 4/1/2024

END OF DEAN SECTION

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**PROGRAM OPTIONAL RESPONSE SECTION (Due within one week of receiving dean's review)**

*Programs have the option to submit to the provost a response to the dean's evaluation within one week of receiving the dean's review, using the narrative box below. Please indicate whether or not you will submit an optional response below.*

**Are you submitting an optional response?** If yes, add your response below, enter your name and date, and follow the guidance below for submission. If no, enter your name and date, and follow the guidance below for submission. **No**

**Optional Response: (10,000 characters or less)**

*After completing this section, the form should be submitted to [uaa.oaa@alaska.edu](mailto:uaa.oaa@alaska.edu), with a copy to the dean. If the program is fully delivered on a community campus, copy the appropriate community campus*

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director(s) as well.

**Committee chair first name last name:** Scott Hamel

**Date:** 4/10/2024

END OF PROGRAM OPTIONAL RESPONSE SECTION

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**PROVOST SECTION (Due on August 1)**

*After completing, signing, and dating the Provost Section of this form, email the completed form to the program review committee and dean, with a copy to [uaa.ooo@alaska.edu](mailto:uaa.ooo@alaska.edu) for posting. If the program is delivered on a community campus, copy the appropriate community campus director(s) as well.*

**Provost's commendations, additional or adjusted recommendations, if any, and other general comments (3500 characters or less):**

I agree with the dean's commendations and would like to recognize the high level of activity in the department, including, among other things, the notably high level of research, the inclusion of graduate students in faculty research, a successful new hire, the updated assessment process, and an active recruitment strategy. I also agree with the dean's recommendations, in particular, the need to grow undergraduate enrollment. As part of its recruitment strategy, the program will want to explore alignment and engagement with the Anchorage School District academies.

While the dean proposed a review in AY2030, I am scheduling this review in AY2031 to align programs with ABET accreditation with that evaluation cycle. This is to ensure the programs receive their accreditation findings with time to reflect and apply them to their program reviews.

Finally, I am asking programs to ensure that all students have access to high-quality, highly-engaged learning opportunities, such as internships, practicums, clinicals, study away, and undergraduate research, regardless of modality or location. Programs will be asked to report on progress toward this goal in their next Program Review. These efforts naturally complement and extend our commitment to UAA's core competencies: Effective Communication; Creative and Critical thinking; Intercultural Fluency; and Personal, Professional, and Community Responsibility. The Civil Engineering program is well positioned to demonstrate this in its next scheduled Program Review.

**Provost's decision:** Continuation -- Program is successfully serving its students and meeting its mission and goals. No immediate changes necessary, other than regular, ongoing program improvements.

**Interim Progress Report:** N/A

**Follow-up Program Review:** N/A

**Next regular Program Review:** AY2031

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Provost's signature:

*Denise K. Runge*

Date: 7/31/2024