6/27/2022

## ACADEMIC PROGRAM REVIEW FORM

All academic programs and units at UAA are required by Board of Regents Policy P10.06.010 to engage in program review on a seven-year cycle. University Regulation R10.06.010 sets out the minimum requirements for program review, including centrality of program mission, quality, demand, program productivity, effectiveness, and efficiency. Exceptional reviews may be conducted, per University Policy and Regulation, and with the provost's approval. The UAA process integrates information about student learning outcomes assessment and the improvement of student learning, as well as progress on student success measures and the closing of equity gaps, aligning program efforts and resources with institutional priorities. Final decisions include commendations and recommendations, which guide future program efforts. The results of cyclical Academic Program Review are reported to the UA Board of Regents annually and are published on the UAA Academic Program Review website.

This form is composed of four parts: the Program Section, the Dean Section, the Program Optional Response Section, and the Provost Section. Guidance for submission is provided in each section.

**Using the Form:** The form is pre-loaded with information specific to each program and sent by the dean to the program. The program should download and save their form to begin using it. The form is locked, so instructions are viewable and the only sections of the document that can be edited are the form fields. To ensure the fillable fields function correctly, the form must be completed in Microsoft Word. It will not function properly in Google Docs. Programs that wish to record collaborative discussion of the report might consider creating a separate document to take notes, prior to entering final responses in the official fillable form.

The form uses narrative boxes, text only, and drop-down boxes. Narrative boxes have a character limit, which includes spaces. To undo an answer, press "Control-Z" or "Command-Z."

Responses are to be narrative text only, and must be ADA and FERPA compliant, and must not include the names of any current or former employees. Do not embed any tables or links, including to webpages or other documents. To be FERPA compliant, do not include the names of any current or former students. Rather, use statements such as, "In AY22 four program graduates were accepted to graduate programs in the field." Programs with specialized accreditation or other external recognitions must comply with restrictions regarding what may be published, as per the accreditor or external organization. Do not include appendices. Appendices to this form will not be accepted.

**Data:** Each program is provided a datasheet, along with this pre-loaded form. For questions about the data, please contact Institutional Research (uaa.oir@alaska.edu).

**Assistance:** For technical assistance with this form, email Academic Affairs (uaa.oaa@alaska.edu).

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**Program(s) in the review:** MS Mechanical Engineering

**Specialized Accrediting Agency (if applicable):** N/A

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

**Year of last review:** AY20

6/27/2022

**Final decision from last review:** Continued Review

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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:**

Raghu Srinivasan, Associate Professor of Mechanical Engineering and Department Chair, UAA

Jennifer Brock, Associate Dean for Academics and Professor of Mechanical Engineering, UAA

Getu Hailu, Associate Professor of Mechanical Engineering and Graduate Chair, UAA

Matt Cullin, Professor of Mechanical Engineering, UAA

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

   *Recommendation 1:   Schedule graduate courses to accommodate the schedules of working professionals.*

   **How do you know the recommendation has been successfully achieved?** *(2000 characters or less)*

   Every effort has been taken to schedule graduate-level courses (including stacked courses) outside the schedule of working professionals from Fall 2020.  The courses are either taught at 8:30 am slot or in the evenings after 4:00 pm.

   **Actions taken to date** *(2000 characters or less)*

   Of the 23 graduate level or stacked courses from Fall 2020, 18 were offered at 8:30 am or after 4:00 pm. That is close to 80% of the courses offered outside the schedule of working professionals.

   **Evidence of success to date** *(2000 characters or less)*

   A significant number of our MSME students are working professionals and we graduated five students in 2021. This follow-up program review also coincides with the pandemic period, with close to 100% of the classes being offered online or hybrid.  These numbers are very small to make any comparisons. Especially most courses were offered asynchronous online mode of delivery in 2021; it is hard to assess the success of the schedule changes right now.

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 significant number of our MSME students are working professionals who feel like they live this core competency daily, and who would probably say that this competency was part of the reason they chose graduate study. The project or thesis, for students who choose one of these options, is an excellent place to hone these skills. The MSME continues to produce high-quality projects and theses. Most of our MSME graduates publish their work in international journals and conferences. The project or thesis, for students who choose one of these options (and the vast majority do), is an excellent place to hone these skills. Both require a high-quality written report and a public oral defense. Journal and conference articles, and presentations at national/international conferences are also examples of high-quality proficiency skills.

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

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

        i.  **MS Mechanical Engineering**

        - *1) Use in-depth methods of analysis; 2) Demonstrate graduate-level mechanical engineering theory; 3) Conduct advanced mechanical engineering research and applications; 4) Apply graduate-level engineering theory to the design of mechanical engineering systems; 5) Work effectively within the professional framework of organizations responsible for the practice of engineering.*

        ***Describe your key findings for these outcomes. (3000 characters or less)***

        We assess all outcomes by sending out a questionnaire to thesis and project committees when a student defends a thesis or project. Last academic year, one graduate completed a thesis, so we collected assessment data for one student. Our MSME students met or exceeded faculty expectations in all areas.

        ***Describe actions taken to improve student learning for these outcomes. (3000 characters or less)***

        In the MSME program, we have struggled with the statistics of small numbers with respect to our assessment data. We continue to work with students on a case-by-case basis to promote their graduate study and support their work.

        ***Describe evidence that these actions are working. (3000 characters or less)***

    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.** *(3000 characters or less)*

The MSME program provides access to graduate-level continuing education in mechanical engineering to place-based students and Southcentral employers. It also expands partnerships with local industry and communities by promoting more significant hands-on research opportunities which address important local engineering problems and often generate intellectual property. The MSME program also enhances interdisciplinary study, research and other collaborations. MSME students were advised by ME tenure-track/tenured professors and worked/working on research projects funded by the Department of Transportation, NASA and other research projects.

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.** *(3000 characters or less)*

   Enrollment numbers are relatively small, which is not unusual for a master's program at UAA, but have been reasonably steady. The Fast Track MSME program (approved starting spring 2018) has increased student enrollment into the MSME program.

   b. **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.]** *(3000 characters or less)*

   Our students who choose a project or thesis continue to demonstrate a high level of accomplishment. Our students have joined Ph.D. programs at universities such as George Mason University, and the University of Alaska Fairbanks. Some we know have obtained their Professional Engineer Licensure and are practicing engineers in Alaska.

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, Number of Program Graduates Who Return to UAA to Pursue an Additional Program, and Gap**

**between Job Openings and Degree Completions. (Note: Gap between Job Openings and Degree Completions not required for AY23 Program Reviews.)** *(3000 characters or less)*

The program meets UAA's mission to support workforce development in the high demand job field of mechanical engineering. Most of the program's graduates work in Alaska, helping to fulfill the higher education needs of the state. The program collaborates with other Engineering departments on curriculum. The program also has many partnerships with local industry, government, and non-profit organizations.

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. (3000 characters or less)**

   The MSME degree awarded peaked at 5 in 2021. The small enrollment and degree award figures make it very difficult to comment on trends.  The SCH/FTEF and FTES/FTEF figures in particular only paint an incomplete picture of the productivity of the ME Department.  A more complete picture would include the students enrolled in the BSME program, which is the second most enrolled baccalaureate program in CoEng.

   **Optional: Discuss the extent to which, if any, extramural funding supports students, equipment, and faculty in the program.** *(2500 characters or less)*

   ME tenure-track/tenured professors employ MSME students in their research programs funded by the Department of Transportation (DoT), NASA, and other internal and external funding sources.

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?** *(2000 characters or less)*

   UAF has the only other MSME program in the state. The faculty at UAA and UAF have technical expertise in different areas, and upper-level elective and graduate courses in particular, emphasize different areas, which makes the relationship between the programs complementary rather than competitive. The programs collaborate on shared curriculum, capstone projects, joint research, and intercampus club activities. Both programs primarily serve their own regions of the state and there is more demand for graduates in the State than is currently produced by UAA and UAF combined.

8. **Assess the strengths of your program and propose one or two action steps to address areas that need improvement.** *(3500 characters or less)*

   Make the non-thesis option for the MSME programs more attractive for working professionals who don't have the time to do a research thesis. MSME students writing their thesis should improve their writing ability by taking ENGL/WRTG courses.  Teaching Assistant (TA) scholarship support from the College of Engineering for MSME students will also improve the program tremendously.

*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:**    Raghu Srinivasan                    **Date:** 2/26/2023

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, and to [uaa.oaa@alaska.edu](mailto:uaa.oaa@alaska.edu). 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.** *(2000 characters or less for each recommendation)*

   *Recommendation 1: Schedule graduate courses to accommodate the schedules of working professionals.* Recommendation has been met.

   A majority of courses are taught in the early-morning or evening slots to accommodate working professionals.  Hybrid modalities have also been incorporated.

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

2. **Centrality of the Program.** *(1750 characters or less)*

   We concur with the centrality of the program to the university/college mission. While the core competencies are typically considered in the context of an undergraduate education, the MSME graduate students do further develop these competencies.

3. **Program Quality and Improvement** *(1750 characters or less)*

   We understand that the number of graduates is low, prohibiting statistical analysis. How does the program work with students on a case-by-case basis in the context of actions taken to improve student learning for the MSME outcomes?  Additionally, no evidence is provided that actions are working. One thesis is referenced but not assessments for the project-based students.

4. **Student Success and the Closing of Equity Gaps** *(1750 characters or less)*

   The number of students is too low to comment on data trends. We agree that a sample of students have demonstrated post-graduate success in industry or continuing to a Ph.D.

*5.* **Demand** *(1750 characters or less)*

We concur with the program that its graduates are in high demand.

6. **Productivity and Efficiency** *(1750 characters or less)*

As described by the program, the small enrollment and number of degree awards prohibits a trend analysis. The program certainly has the capacity to handle more MSME students. Since the program shares most of its resources with the BSME program and the number of BSME students far exceeds the MSME students, we believe that productivity and efficiency of the BSME program should provide the key metrics for the combined programs.

7. **Duplication and Distinctiveness** *(1750 characters or less)*

We concur with the program's assessment that UAF and UAA offer complementary programs and commend the UAA MSME program for collaboration with UAF CEM where appropriate.

8. **Strengths and Ideas for Moving Forward** *(1750 characters or less)*

We agree with the program's ideas to make the non-thesis option more attractive and to consider curricular changes that will strengthen students' writing skills.

**Dean's Final Evaluation**

**I commend the program for:** *(number and list the specific commendations in the narrative box, 1500 character limit)*

1)  Offering a majority of MSME courses during the early morning or late afternoon/evening hours and also utilizing multiple delivery methodologies.

2)  Providing MSME students with important research, local engineering, and interdisciplinary projects.

**I recommend that the program:** *(number and list the specific recommendations in the narrative box, 1500 character limit)*

1) In conjunction with the Dean's Office, develop and implement new strategies to recruit students to the program.

2) Develop the ideas to make the program more attractive for non-thesis working professionals and improve their writing abilities.

3) Collect and present more formal evidence, even if qualitative rather than quantitative, for program quality and potential areas for improvement toward student learning outcomes.

**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:** AY2028

*After completing the Dean Section above, the dean should enter their name, date, and email this form to the committee, and to [uaa.oaa@alaska.edu](mailto:uaa.oaa@alaska.edu). 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:** 3/27/2023

END OF DEAN SECTION

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 director(s) as well.*

**Committee chair first name last name**:     Raghu Srinivasan                    **Date:** 4/3/2023

END OF PROGRAM OPTIONAL RESPONSE SECTION

**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.oaa@alaska.edu](mailto:uaa.oaa@alaska.edu) for posting. If the program is delivered on a community campus, copy the appropriate community campus director(s) as well.*

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**Provost's commendations, additional or adjusted recommendations, if any, and other general comments** *(3000 characters or less)*:

I agree with the dean's commendations and request that the program continue to explore best approaches to scheduling to meet the students' needs. In addition, I commend the program for success in growing your own, with a new hire starting next fall semester. I also agree with the dean's recommendations. In addition, I recommend that the program evaluate the curriculum for opportunities to develop new graduate courses that will attract the program's own undergraduate students and more UAA graduates into the program. The program should also consider working with Enrollment Services to develop a BS/MS recruitment plan, which might include working with the Middle College School, and, as the dean also suggests, the program should continue to focus on the non-thesis option for recruitment.

As I did last year in the Program Review process, I am asking programs to think about how they put students first. This includes continuing to monitor any courses with high DFW rates and seeking out strategies for remediation as needed. It also includes continuing to think about what it means to embrace diversity and inclusivity on the course and program level and to demonstrate this in your particular program(s). This could be through the use of proven, high-impact practices at the program level, or through proven pedagogic strategies such as designing assignments using Transparency in Learning and Teaching (TILT). It can also be through implementing OER and ZTC materials, particularly where course materials can be more reflective of diverse perspectives, or by using the same materials across all sections of a course. Finally, I am asking that every program identify at least one opportunity for students to develop each of UAA's core competency within the program's curricular and/or co-curricular offerings.

The next review will combine the BS Mechanical Engineering with the MS Mechanical Engineering in a single review in AY24, allowing both to report on updates and actions at that time.

**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 year:** N/A
>
> **Follow-up Program Review year:** N/A
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> **Next regular Program Review:** AY2024

**Provost's signature**: _Denise K. Runge_                    **Date:** 5/12/2023