



Date: May 6, 2013
To: Thomas Case, Chancellor *6/6/2013*
From: Elisha Baker, Provost and Vice Chancellor for Academic Affairs *ER Baker 6/5/13*
Subject: Request for Approval of Proposed Master of Science in Mechanical Engineering

The School of Engineering is proposing a Master of Science in Mechanical Engineering (MSME) program in response to growth of the Bachelor of Science in Engineering concentration in Mechanical Engineering and demand by employers, advisory boards, alumni, and students.

The elements needed to implement the MSME program are in place, including the current faculty, administrative support, and lab space of the department. Based upon enrollment projections, additional faculty hires and construction of additional lab space are not required for the proposed program. Graduate-level Mechanical Engineering courses are already being offered as advanced engineering electives in sufficient numbers to support this master's degree. Existing library, student services, and academic services are sufficient and available to enrolling students.

The program proposal has been approved by the faculty, dean, and appropriate UAA curriculum committees. The program faculty have also coordinated with colleagues at the UAF College of Engineering and Mines and received positive responses regarding the proposed program and possible opportunities for collaboration. Following your approval, the prospectus will be submitted to the Board of Regents through the Statewide Academic Council.

Attachments:

BOR Program Action Request Form
MSME Program Prospectus and Executive Summary



Board of Regents Program Action Request
University of Alaska
 Proposal to Add, Change, or Delete a Program of Study

1a. Major Academic Unit (choose one) UAA	1b. School or College EN SOENGR	1c. Department or Program Mechanical Engineering (ME)																																												
2. Complete Program Title Master of Science, Mechanical Engineering																																														
3. Type of Program																																														
<input type="checkbox"/> Undergraduate Certificate <input type="checkbox"/> AA/AAS <input type="checkbox"/> Baccalaureate <input type="checkbox"/> Post-Baccalaureate Certificate <input checked="" type="checkbox"/> Master's <input type="checkbox"/> Graduate Certificate <input type="checkbox"/> Doctorate																																														
4. Type of Action		5. Implementation date (semester, year)																																												
<input checked="" type="checkbox"/> Add <input type="checkbox"/> Change <input type="checkbox"/> Delete		<input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring Year 2013																																												
6. Projected Revenue and Expenditure Summary. Not Required if the requested action is deletion. (Provide information for the 5 th year after program or program change approval if a baccalaureate or doctoral degree program; for the 3 rd year after program approval if a master's or associate degree program; and for the 2 nd year after program approval if a graduate or undergraduate certificate. If information is provided for another year, specify (1st) and explain in the program summary attached). Note that Revenues and Expenditures are not always entirely new; some may be current (see 7d.)																																														
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Projected Annual Revenues in FY 14</th> <th colspan="2">Projected Annual Expenditures in FY 14</th> </tr> </thead> <tbody> <tr> <td>Unrestricted</td> <td></td> <td>Salaries & benefits (faculty and staff)</td> <td>\$1,163,209</td> </tr> <tr> <td>General Fund</td> <td>\$767,520</td> <td>Other (commodities, services, etc.)</td> <td>\$119,000</td> </tr> <tr> <td>Student Tuition & Fees</td> <td>\$403,054</td> <td>TOTAL EXPENDITURES</td> <td>\$1,282,209</td> </tr> <tr> <td>Indirect Cost Recovery</td> <td>\$0</td> <td>One-time Expenditures to Initiate Program (if >\$250,000)</td> <td></td> </tr> <tr> <td>TVEP or Other (specify):</td> <td>\$0</td> <td>(These are costs in addition to the annual costs, above.)</td> <td></td> </tr> <tr> <td>Restricted</td> <td></td> <td>Year 1</td> <td>\$0</td> </tr> <tr> <td>Federal Receipts</td> <td>\$0</td> <td>Year 2</td> <td>\$0</td> </tr> <tr> <td>TVEP or Other (specify): Foundation</td> <td>\$205,000</td> <td>Year 3</td> <td>\$0</td> </tr> <tr> <td>Industry Contributions</td> <td></td> <td>Year 4</td> <td>\$0</td> </tr> <tr> <td>TOTAL REVENUES</td> <td>\$1,375,574</td> <td></td> <td></td> </tr> </tbody> </table>			Projected Annual Revenues in FY 14		Projected Annual Expenditures in FY 14		Unrestricted		Salaries & benefits (faculty and staff)	\$1,163,209	General Fund	\$767,520	Other (commodities, services, etc.)	\$119,000	Student Tuition & Fees	\$403,054	TOTAL EXPENDITURES	\$1,282,209	Indirect Cost Recovery	\$0	One-time Expenditures to Initiate Program (if >\$250,000)		TVEP or Other (specify):	\$0	(These are costs in addition to the annual costs, above.)		Restricted		Year 1	\$0	Federal Receipts	\$0	Year 2	\$0	TVEP or Other (specify): Foundation	\$205,000	Year 3	\$0	Industry Contributions		Year 4	\$0	TOTAL REVENUES	\$1,375,574		
Projected Annual Revenues in FY 14		Projected Annual Expenditures in FY 14																																												
Unrestricted		Salaries & benefits (faculty and staff)	\$1,163,209																																											
General Fund	\$767,520	Other (commodities, services, etc.)	\$119,000																																											
Student Tuition & Fees	\$403,054	TOTAL EXPENDITURES	\$1,282,209																																											
Indirect Cost Recovery	\$0	One-time Expenditures to Initiate Program (if >\$250,000)																																												
TVEP or Other (specify):	\$0	(These are costs in addition to the annual costs, above.)																																												
Restricted		Year 1	\$0																																											
Federal Receipts	\$0	Year 2	\$0																																											
TVEP or Other (specify): Foundation	\$205,000	Year 3	\$0																																											
Industry Contributions		Year 4	\$0																																											
TOTAL REVENUES	\$1,375,574																																													
Page # of attached summary where the budget is discussed, including initial phase-in: 5																																														
7. Budget Status. Items a., b., and c. indicate the source(s) of the General Fund revenue specified in item 6. If any grants or contracts will supply revenue needed by the program, indicate amount anticipated and expiration date, if applicable.																																														
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Revenue source</th> <th>Continuing</th> <th>One-time</th> </tr> </thead> <tbody> <tr> <td>a. In current legislative budget request</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>b. Additional appropriation required</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>c. Funded through new internal MAU redistribution</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>d. Funds already committed to the program by the MAU¹</td> <td>\$1,170,574 (existing GF, tuition/fees with projected increase)</td> <td>\$0</td> </tr> <tr> <td>e. Funded all or in part by external funds, expiration date Industry contributions for program labs (reduced to 5K in FY15 and expires at end of FY15)</td> <td>\$205,000</td> <td>\$0</td> </tr> <tr> <td>f. Other funding source Specify Type:</td> <td>\$0</td> <td>\$0</td> </tr> </tbody> </table>			Revenue source	Continuing	One-time	a. In current legislative budget request	\$0	\$0	b. Additional appropriation required	\$0	\$0	c. Funded through new internal MAU redistribution	\$0	\$0	d. Funds already committed to the program by the MAU ¹	\$1,170,574 (existing GF, tuition/fees with projected increase)	\$0	e. Funded all or in part by external funds, expiration date Industry contributions for program labs (reduced to 5K in FY15 and expires at end of FY15)	\$205,000	\$0	f. Other funding source Specify Type:	\$0	\$0																							
Revenue source	Continuing	One-time																																												
a. In current legislative budget request	\$0	\$0																																												
b. Additional appropriation required	\$0	\$0																																												
c. Funded through new internal MAU redistribution	\$0	\$0																																												
d. Funds already committed to the program by the MAU ¹	\$1,170,574 (existing GF, tuition/fees with projected increase)	\$0																																												
e. Funded all or in part by external funds, expiration date Industry contributions for program labs (reduced to 5K in FY15 and expires at end of FY15)	\$205,000	\$0																																												
f. Other funding source Specify Type:	\$0	\$0																																												
8. Facilities: New or substantially (>\$25,000 cost) renovated facilities will be required. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																														
If yes, discuss the extent, probable cost, and anticipated funding source(s), in addition to those listed in sections 6 and 7 above.																																														

¹Sometimes the courses required by a new degree or certificate program are already being taught by an MAU, e.g., as a minor requirement. Similarly, other program needs like equipment may already be owned. 100% of the value is indicated even though the course or other resource may be shared.

9. Projected enrollments (headcount of majors). If this is a program deletion request, project the teach out enrollments.

Year 1: 17

Year 2: 24

Year 3: 34

Year 4: 48

Page number of attached summary where demand for this program is discussed: 5

10. Number* of new TA or faculty hires anticipated (or number of positions eliminated if a program deletion):

Graduate TA	0
Adjunct	0
Term	0
Tenure track	0

11. Number* of TAs or faculty to be reassigned:

Graduate TA	0
Adjunct	0
Term	0
Tenure track	0

Former assignment of any reassigned faculty: 0

For more information see page 6 of the attached summary.

12. Other programs affected by the proposed action, including those at other MAUs (please list):

Program Affected	Anticipated Effect
Civil Engineering, Computer Science and Engineering, Electrical Engineering, Physics	A small number of MSME students may enroll in CE, CS, CSE, EE, or Physics courses or may collaborate with faculty or students on research or projects
Mathematics	MSME students who choose the thesis option are encouraged to enroll in 6 credits of 400 level or above MATH or STAT courses. MSME students may collaborate with faculty or students on research or projects.
Project Management	MSME students who choose the non-thesis option are required to enroll in PM A601.
UAF Mechanical Engineering	Opportunities for new research collaboration between UAF and UAA ME faculty members, opportunities for the two MSME programs to complement each other by expanding existing course offerings through distance delivery. (Communicated with UAF College of Engineering and Mines and Mechanical Engineering Department.)

Page number of attached summary where effects on other programs are discussed: 3

13. Specialized accreditation or other external program certification needed or anticipated. List all that apply or 'none': None

14. Aligns with University or campus mission, goals, core themes, and objectives (list): The proposed Master of Science in Mechanical Engineering (MSME) program advances the UA Academic Master Plan priorities by:

- Providing access to graduate-level study and continuing education in mechanical engineering to place-based students and employers
- Promoting more significant hands-on research opportunities for students and collaboration with local industry to solve engineering problems and generate intellectual property
- Enhancing interdisciplinary study, research and other collaborations

The proposed MSME Program advances the priorities in the UAA 2017 Strategic Plan by:

- Providing new opportunities for local mechanical engineering students and engineers at the graduate level, particularly for Professional Mechanical Engineers (Priority A)
- Advancing the level of student research through long-term relationships with faculty advisors (Priorities A and B)
- Collaborating with local employers to solve engineering problems and identify research projects (Priority B and E)

- Increasing opportunities for interdisciplinary study, research and collaboration (Priority D)

Page in attached summary where alignment is discussed: 1

15. State needs met by this program (list): Alaska benefits from having a pool of highly qualified in-state engineers:

- Hires from within Alaska have a higher retention rate and direct cost savings over hires recruited from outside Alaska; and
- Master's level engineers offer greater levels of technical skill and specialization.

Anchorage employers benefit from a strong local university:

- More than 100 engineering, energy, utilities, and construction employers operate within a five-mile radius of the UAA main campus;
- Employers need more highly qualified engineers, scientists, and technically skilled managers who possess mastery and autonomy gained through graduate education;
- Anchorage employs the largest number of Alaska's mechanical engineers; and
- Replacement of skilled mechanical engineers who retire requires a level of knowledge and maturity that can be accelerated through completing an MSME program.

Professional Engineers (PEs) are required to meet continuing education requirements to maintain their licensure:

- Engineers need access to opportunities for professional growth, development and advancement;
- Coursework outside of the Anchorage is not an option for most local engineers. Employed engineers have job and family commitments that limit their ability to travel for extended periods of time;
- A strong need exists for a locally-available graduate degree program in Mechanical Engineering within the Anchorage area; and
- A Master's degree is increasingly seen as the terminal degree for practicing mechanical engineers.

The proposed MSME Program has a strong level of support, described and quantified in detail in the full Prospectus, among both the SOE and ME Advisory Boards, current BSE ME students, BSE ME alumni, local engineering employers, and faculty and administrators throughout the UAA campus.

Page in the attached summary where the state needs to be met are discussed: 3

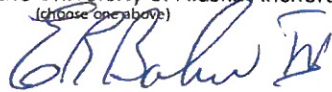
16. Program is initially planned to be: (check all that apply)

- ☒ Available to students attending classes at campus(es).
- ☐ Available to students via e-learning.
- ☒ Partially available students via e-learning.

Page # in attached summary where e-learning is discussed: 3-4

Submitted by the University of Alaska Anchorage with the concurrence of its Faculty Senate.

(Choose one above)



Provost

6/05/13

Date

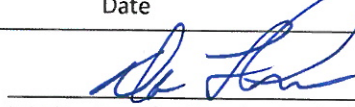


Chancellor

6 May 2013

Date

- ☐ Recommend Approval
- ☐ Recommend Disapproval


UA Vice President for Academic Affairs on behalf of
the Statewide Academic Council

3/20/2013

Date

*Net FTE (full-time equivalents). For example, if a faculty member will be reassigned from another program, but his/her original program will hire a replacement, there is one net new faculty member. Use fractions if appropriate. Graduate TAs are normally 0.5 FTE. The numbers should be consistent with the revenue/expenditure information provided.

Attachments: ☐ Summary of Degree or Certificate Program Proposal

☐ Other (optional)

Revised: 10/10/2012



New Program Proposal
Executive Summary
 (See University Regulation R10.04.020.C)

This is a summary of a full prospectus. The full prospectus is available upon request.

Degree/Certificate Title & Responsible Program

Major Academic Unit UAA	School or College EN SOENGR	Department Mechanical Engineering (ME)
Complete Program Title Master of Science, Mechanical Engineering		
Type of Program	<input type="checkbox"/> Undergrad Certificate <input type="checkbox"/> AA/AAS <input type="checkbox"/> Baccalaureate	
	<input checked="" type="checkbox"/> Masters <input type="checkbox"/> Graduate Certificate <input type="checkbox"/> Doctoral	

The UAA Mechanical Engineering (ME) Department is proposing a Master of Science in Mechanical Engineering (MSME) program in response to growth of the undergraduate program and demand by employers, advisory boards, alumni and students. The proposed program is designed with a thesis option for students who wish to prepare for research-oriented occupations, a PhD degree, or advanced engineering practice, and a non-thesis option for students who wish to emphasize advanced engineering practice.

1. Relationship of the proposed program relative to the educational mission of the University of Alaska and the MAU.

The proposed Master of Science in Mechanical Engineering (MSME) program advances the UA Academic Master Plan priorities by:

- Providing access to graduate-level study and continuing education in mechanical engineering to place-based students and employers
- Promoting more significant hands-on research opportunities for students and collaboration with local industry to solve engineering problems and generate intellectual property
- Enhancing interdisciplinary study, research and other collaborations

The proposed MSME Program advances the priorities in the UAA 2017 Strategic Plan by:

- Providing new opportunities for local mechanical engineering students and engineers at the graduate level, particularly for Professional Mechanical Engineers (Priority A)
- Advancing the level of student research through long-term relationships with faculty advisors (Priorities A and B)
- Collaborating with local employers to solve engineering problems and identify research projects (Priority B and E)
- Increasing opportunities for interdisciplinary study, research and collaboration (Priority D)

2. History of the development of the proposed program.

The proposed MSME program was developed as a natural extension of the growth of the UAA SOE ME Department enrollment, as well in response to demand for a graduate mechanical engineering program from the SOE and ME advisory boards, Bachelor of Science in Engineering mechanical engineering specialization (BSE ME) alumni and current students, and Anchorage engineering employers. The ME faculty increasingly received inquiries regarding an MSME program. Those inquiries and department growth to a level that made offering a program feasible spurred ME faculty to assess the demand of employers, alumni, and students for such a program. The assessment results indicated strong demand, and the MSME program proposal development and approval process was initiated.

The proposed MSME catalog copy was adapted from the well-established Master of Science in Civil Engineering (MSCE) catalog copy to be consistent with peer ME programs and meet the needs of employers, alumni, and students. The Civil Engineering (CE) Department and its programs have similar enrollment, professional goals, and Anchorage area employment numbers. Graduate level ME courses stacked with advanced engineering electives were developed by ME faculty to expand alternatives for undergraduate students while considering constituent needs and faculty expertise. Mechanical engineering graduate student research opportunities will be an extension of successful, established ME faculty research activity.

3. Impact of the proposed program on existing UA programs, including the GER.

The proposed graduate program is without GER requirements. It is anticipated that MSME students will enroll primarily in advanced ME courses and have ME faculty as their principal research and program advisors, and impact upon existing UA programs is expected to be minimal. Mechanical Engineering faculty have coordinated with and received support from several UAA departments, including Civil Engineering, Computer Science and Engineering, Electrical Engineering, Mathematics, Physics, Project Management, and WWAMI.

The proposed MSME program could complement existing graduate mechanical engineering programs within the UA system by expanding existing distance delivery course offerings. It could be possible for UAS, UAA and UAF students to interact with faculty with areas of expertise not emphasized at their home institution. UA students could be able to tailor their coursework to their interests, although traditional in-class and in-lab student experience is preferred and a UAA program will primarily serve place-bound Anchorage area students.

Coordination on the proposed UAA MSME program with UAF College of Engineering & Mines Dean Doug Goering, Professor, Ph.D., P.E., Mechanical Engineering, has been ongoing and first occurred at the September 2012 UAA SOE Advisory Board meeting. A February 2013 email with drafts of the proposed UAA MSME catalog copy and Prospectus Executive Summary attached was sent to the UAF CEM Dean Goering. Dean Goering's response to the proposed program has been positive, acknowledging the efficiency of offering a UAA MSME program to Anchorage professionals and the opportunity for more collaborative teaching. He has not expressed any concerns regarding the proposed program.

In addition, a February 2013 email requesting feedback with the proposed UAA MSME catalog copy attached was sent to the UAF ME faculty. A follow-up telephone call was made to each email recipient. To date, responses from the faculty have been positive regarding the proposed program and catalog copy, as well as the possible opportunities for collaboration. The faculty comments have not included any significant concerns.

4. State needs met by the proposed program.

More than 100 engineering, energy, utilities and construction employers operate within the immediate area surrounding the UAA campus, with even more operating within the Municipality of Anchorage and the surrounding communities. These employers need more highly qualified engineers, scientists and technically skilled managers who possess the mastery and autonomy gained through graduate education.

Working engineers need access to opportunities for professional growth, development and advancement, including continuing education required to maintain Professional Engineer (P.E.) licensure. A master's degree is increasingly seen as the terminal degree for practicing mechanical engineers. Most of Alaska's mechanical engineers are employed in Anchorage and the surrounding areas and have job, family and other obligations that preclude their leaving the area for extended periods of time. Surveys of BSE ME alumni show that 47% have an interest in a master's degree but have not enrolled in a graduate program because they do not want to move to another city or state. The proposed program will meet the needs of these place-bound mechanical engineers as well as current ME students who wish to pursue a master's degree at the completion of the undergraduate program.

Surveys of employers, alumni, and current students indicate a high level of support for the proposed program, with 73% of employers, 83% of alumni, and 93% of current students supporting the proposed degree. These surveys also indicate that interest in enrolling in a program of ME graduate study is high among students (69%) and alumni (71%).

On a broader level, the proposed MSME program will strengthen the state of Alaska by increasing the pool of highly-qualified and skilled engineers. The program will foster an environment of scholarship and inquiry, with increased opportunities for research experience and collaboration with industry for both graduates and undergraduates.

5. Student opportunities, outcomes, and enrollment projections.

The proposed MSME has a thesis and a non-thesis option. The thesis and non-thesis options reflect the positive faculty experience at other institutions with MS programs with thesis and non-thesis options as well as the needs of employers, alumni, and students. The thesis option focuses on skills related to the acquisition of new knowledge and is designed for students who wish to pursue research-oriented occupations or a PhD degree, as well as to prepare for advanced professional engineering practice. The non-thesis option focuses on advanced engineering practice and is designed for students who prefer to substitute additional classroom education and a comprehensive written exam or a project for graduate research experience.

Distance learning will be used to accommodate and provide increased access to students who travel frequently as part of their jobs. For example, PM A601 is taught so that students both on campus and off can participate, providing a model that can be adapted as appropriate for each course's content in the program.

Research taking place within the ME Department involves collaboration with other departments and colleges and the Anchorage community. This has led to ongoing research projects that are unique within the state of Alaska. The faculty expect collaborative research projects to be an integral part of the MSME program, furthering research and design opportunities for graduate and undergraduate ME students.

Table 5.1. Educational Objectives

The UAA MSME program objectives are to provide graduates with:

1. Graduate-level technical knowledge within mechanical engineering.
2. An ability to conceive and conduct graduate-level engineering research and problem solving.
3. An ability to effectively communicate graduate-level engineering concepts and applications.

Enrollment and degrees awarded data from the CE undergraduate and graduate programs, the BSE ME undergraduate program, and the SOE were used to project MSME enrollments.

Table 5.2. Enrollment Projections for the MSME Program

	Year 1	Year 2	Year 3	Year 4	Year 5
Enrollment Headcount	17	24	34	48	67
FTE Enrollment	8	11	15	20	28
Graduates (Degrees Awarded)	2	3	4	7	12

The FTE and graduate numbers are much lower than the enrollment headcount. Based upon CE program experience, 20% of MSME students enrolled will be full-time, completing their degrees in 1-2 years; the remaining 80% of students will be part-time while working full-time in industry, completing their degrees in 2-6 years. Most part-time students will require minimal academic or research advising. Existing classroom and course capacity will allow for the projected MSME program enrollment.

6. Faculty and staff workload implications.

The UAA Mechanical Engineering Department currently has seven full-time tenured and tenure-track tripartite faculty members. One faculty position was recently vacated. It is currently filled by a term faculty member, and the hiring process for a full-time tenure-track tripartite faculty member is under way. Many peer institutions with similar levels of faculty support have successful graduate programs. Eight faculty members are expected to be sufficient for the projected enrollment.



New Program Proposal
Executive Summary
 (See University Regulation R10.04.020.C)

This is a summary of a full prospectus. The full prospectus is available upon request.

Degree/Certificate Title & Responsible Program

Major Academic Unit UAA	School or College EN SOENGR	Department Mechanical Engineering (ME)
Complete Program Title Master of Science, Mechanical Engineering		
Type of Program	<input type="checkbox"/> Undergrad Certificate <input type="checkbox"/> AA/AAS <input type="checkbox"/> Baccalaureate	
	<input checked="" type="checkbox"/> Masters <input type="checkbox"/> Graduate Certificate <input type="checkbox"/> Doctoral	

The UAA Mechanical Engineering (ME) Department is proposing a Master of Science in Mechanical Engineering (MSME) program in response to growth of the undergraduate program and demand by employers, advisory boards, alumni and students. The proposed program is designed with a thesis option for students who wish to prepare for research-oriented occupations, a PhD degree, or advanced engineering practice, and a non-thesis option for students who wish to emphasize advanced engineering practice.

1. Relationship of the proposed program relative to the educational mission of the University of Alaska and the MAU.

The proposed Master of Science in Mechanical Engineering (MSME) program advances the UA Academic Master Plan priorities by:

- Providing access to graduate-level study and continuing education in mechanical engineering to place-based students and employers
- Promoting more significant hands-on research opportunities for students and collaboration with local industry to solve engineering problems and generate intellectual property
- Enhancing interdisciplinary study, research and other collaborations

The proposed MSME Program advances the priorities in the UAA 2017 Strategic Plan by:

- Providing new opportunities for local mechanical engineering students and engineers at the graduate level, particularly for Professional Mechanical Engineers (Priority A)
- Advancing the level of student research through long-term relationships with faculty advisors (Priorities A and B)
- Collaborating with local employers to solve engineering problems and identify research projects (Priority B and E)
- Increasing opportunities for interdisciplinary study, research and collaboration (Priority D)

2. History of the development of the proposed program.

The proposed MSME program was developed as a natural extension of the growth of the UAA SOE ME Department enrollment, as well in response to demand for a graduate mechanical engineering program from the SOE and ME advisory boards, Bachelor of Science in Engineering mechanical engineering specialization (BSE ME) alumni and current students, and Anchorage engineering employers. The ME faculty increasingly received inquiries regarding an MSME program. Those inquiries and department growth to a level that made offering a program feasible spurred ME faculty to assess the demand of employers, alumni, and students for such a program. The assessment results indicated strong demand, and the MSME program proposal development and approval process was initiated.

The proposed MSME catalog copy was adapted from the well-established Master of Science in Civil Engineering (MSCE) catalog copy to be consistent with peer ME programs and meet the needs of employers, alumni, and students. The Civil Engineering (CE) Department and its programs have similar enrollment, professional goals, and Anchorage area employment numbers. Graduate level ME courses stacked with advanced engineering electives were developed by ME faculty to expand alternatives for undergraduate students while considering constituent needs and faculty expertise. Mechanical engineering graduate student research opportunities will be an extension of successful, established ME faculty research activity.

3. Impact of the proposed program on existing UA programs, including the GER.

The proposed graduate program is without GER requirements. It is anticipated that MSME students will enroll primarily in advanced ME courses and have ME faculty as their principal research and program advisors, and impact upon existing UA programs is expected to be minimal. Mechanical Engineering faculty have coordinated with and received support from several UAA departments, including Civil Engineering, Computer Science and Engineering, Electrical Engineering, Mathematics, Physics, Project Management, and WWAMI.

The proposed MSME program could complement existing graduate mechanical engineering programs within the UA system by expanding existing distance delivery course offerings. It could be possible for UAS, UAA and UAF students to interact with faculty with areas of expertise not emphasized at their home institution. UA students could be able to tailor their coursework to their interests, although traditional in-class and in-lab student experience is preferred and a UAA program will primarily serve place-bound Anchorage area students.

Coordination on the proposed UAA MSME program with UAF College of Engineering & Mines Dean Doug Goering, Professor, Ph.D., P.E., Mechanical Engineering, has been ongoing and first occurred at the September 2012 UAA SOE Advisory Board meeting. A February 2013 email with drafts of the proposed UAA MSME catalog copy and Prospectus Executive Summary attached was sent to the UAF CEM Dean Goering. Dean Goering's response to the proposed program has been positive, acknowledging the efficiency of offering a UAA MSME program to Anchorage professionals and the opportunity for more collaborative teaching. He has not expressed any concerns regarding the proposed program.

In addition, a February 2013 email requesting feedback with the proposed UAA MSME catalog copy attached was sent to the UAF ME faculty. A follow-up telephone call was made to each email recipient. To date, responses from the faculty have been positive regarding the proposed program and catalog copy, as well as the possible opportunities for collaboration. The faculty comments have not included any significant concerns.

4. State needs met by the proposed program.

More than 100 engineering, energy, utilities and construction employers operate within the immediate area surrounding the UAA campus, with even more operating within the Municipality of Anchorage and the surrounding communities. These employers need more highly qualified engineers, scientists and technically skilled managers who possess the mastery and autonomy gained through graduate education.

Working engineers need access to opportunities for professional growth, development and advancement, including continuing education required to maintain Professional Engineer (P.E.) licensure. A master's degree is increasingly seen as the terminal degree for practicing mechanical engineers. Most of Alaska's mechanical engineers are employed in Anchorage and the surrounding areas and have job, family and other obligations that preclude their leaving the area for extended periods of time. Surveys of BSE ME alumni show that 47% have an interest in a master's degree but have not enrolled in a graduate program because they do not want to move to another city or state. The proposed program will meet the needs of these place-bound mechanical engineers as well as current ME students who wish to pursue a master's degree at the completion of the undergraduate program.

Surveys of employers, alumni, and current students indicate a high level of support for the proposed program, with 73% of employers, 83% of alumni, and 93% of current students supporting the proposed degree. These surveys also indicate that interest in enrolling in a program of ME graduate study is high among students (69%) and alumni (71%).

On a broader level, the proposed MSME program will strengthen the state of Alaska by increasing the pool of highly-qualified and skilled engineers. The program will foster an environment of scholarship and inquiry, with increased opportunities for research experience and collaboration with industry for both graduates and undergraduates.

5. Student opportunities, outcomes, and enrollment projections.

The proposed MSME has a thesis and a non-thesis option. The thesis and non-thesis options reflect the positive faculty experience at other institutions with MS programs with thesis and non-thesis options as well as the needs of employers, alumni, and students. The thesis option focuses on skills related to the acquisition of new knowledge and is designed for students who wish to pursue research-oriented occupations or a PhD degree, as well as to prepare for advanced professional engineering practice. The non-thesis option focuses on advanced engineering practice and is designed for students who prefer to substitute additional classroom education and a comprehensive written exam or a project for graduate research experience.

Distance learning will be used to accommodate and provide increased access to students who travel frequently as part of their jobs. For example, PM A601 is taught so that students both on campus and off can participate, providing a model that can be adapted as appropriate for each course's content in the program.

Research taking place within the ME Department involves collaboration with other departments and colleges and the Anchorage community. This has led to ongoing research projects that are unique within the state of Alaska. The faculty expect collaborative research projects to be an integral part of the MSME program, furthering research and design opportunities for graduate and undergraduate ME students.

Table 5.1. Educational Objectives

The UAA MSME program objectives are to provide graduates with:

1. Graduate-level technical knowledge within mechanical engineering.
2. An ability to conceive and conduct graduate-level engineering research and problem solving.
3. An ability to effectively communicate graduate-level engineering concepts and applications.

Enrollment and degrees awarded data from the CE undergraduate and graduate programs, the BSE ME undergraduate program, and the SOE were used to project MSME enrollments.

Table 5.2. Enrollment Projections for the MSME Program

	Year 1	Year 2	Year 3	Year 4	Year 5
Enrollment Headcount	17	24	34	48	67
FTE Enrollment	8	11	15	20	28
Graduates (Degrees Awarded)	2	3	4	7	12

The FTE and graduate numbers are much lower than the enrollment headcount. Based upon CE program experience, 20% of MSME students enrolled will be full-time, completing their degrees in 1-2 years; the remaining 80% of students will be part-time while working full-time in industry, completing their degrees in 2-6 years. Most part-time students will require minimal academic or research advising. Existing classroom and course capacity will allow for the projected MSME program enrollment.

6. Faculty and staff workload implications.

The UAA Mechanical Engineering Department currently has seven full-time tenured and tenure-track tripartite faculty members. One faculty position was recently vacated. It is currently filled by a term faculty member, and the hiring process for a full-time tenure-track tripartite faculty member is under way. Many peer institutions with similar levels of faculty support have successful graduate programs. Eight faculty members are expected to be sufficient for the projected enrollment.

The ME Department Chair or an ME faculty member will be responsible for program coordination, and ME faculty will be responsible for student advising. The current graduate ME courses, sufficient in numbers, quality and rigor for a master's degree, are already being taught as advanced engineering electives. The SOE administrative and student services support many well-established graduate programs and are sufficient to support the proposed MSME program. Significant faculty and staff workload adjustments will not be necessary for the projected enrollment.

7. Fiscal Plan for the proposed program.

As indicated above, no significant additional resources (personnel or facilities) will be needed for the proposed MSME program at the projected enrollments. New revenue from ME graduate student tuition and fees returned to the ME department will be used to offset the new expenses of offering graduate teaching assistantships to full-time students and research project support.

Along with existing general fund and tuition/fees revenue, the department also has Foundation funds from industry contributions to the program's laboratories. The Foundation funds will be \$205K in FY14 and \$5K in FY15 (the final year of the grant). Expenses are tied directly to revenue, and costs will not be incurred when the Foundation funds expire. These funds are included in the BOR PAR form, but are not included in the incremental expenses table below because the proposed program will not affect the funds.

Table 7.1. Incremental Expenses, Revenues, and Balances

Year	New Expenses ¹	New Revenue ²	Balance
Yr 1	37,330	37,330	0
Yr 2	51,371	51,371	0
Yr 3	70,100	70,100	0
Yr 4	93,600	93,600	0
Yr 5	131,030	131,030	0

¹Graduate teaching assistantships for full-time students and research project support.

²Revenue from ME graduate student tuition and fees based upon projected enrollment returned to the ME department.