

Proposal Summary

The Department of Mechanical Engineering proposes a NEW integrated B.S./M.S. degree program for qualified undergraduate students to complete B.S. and M.S. degrees in a shorter time than traditional B.S. plus M.S. degrees.

Background

The Department of Mechanical Engineering proposes a combined accelerated degree for Mechanical Engineering undergraduate students. This program is designed for students to complete both a Bachelor of Science and a Master of Science Degree in five years. The basic rationales for the program are:

1. Better use of University resources
2. Leverage existing strong B.S. programs to increase graduate enrollment
3. A national trend in a highly demanding field
4. An attractive option for qualified undergraduate students

Proposed Catalog Layout:

1. Complete the following admission requirements:
 - a. ME major (junior preferred) or senior standing.
 - b. GPA 3.25 or above (based on minimum of 24 credits in ME major requirements). Students must maintain a cumulative GPA of 3.0 to remain in the program.
 - c. Submit three letters of references.
 - d. Submit GRE (general) scores.
 - e. Submit a study goal statement.
 - f. Submit a UAF graduate application for admission.
2. Complete the general university requirements.
3. Complete B.S. degree requirements (As part of the B.S. degree requirements, complete MATH F201X, PHYS F211X and PHYS F212X).
4. Complete the master's degree requirements.
5. Complete the following B.S. program (major) requirements:
 - ES F101-Introduction to Engineering 3
 - ES F201-Computer Techniques 3
 - ES F209-Statics 3
 - ES F210-Dynamics 3
 - ES F301-Engineering Analysis 3
 - ES F307-Elements of Electrical Engineering 3

ES F331-Mechanics of Materials 3
ES F341-Fluid Mechanics 4
ES F346-Basic Thermodynamics 3
ESM F450W-Economic Analysis and Operations 3
MATH F202X-Calculus 4
MATH F302-Differential Equations 3
ME F302-Dynamics of Machinery 4
ME F308-Measurement and Instrumentation 3
ME F313-Mechanical Engineering Thermodynamics 3
ME F321-Industrial Processes 3
ME F334-Elements of Materials Science/Engineering 3
ME F403-Machine Design 3
ME F408-Mechanical Vibrations 3
ME 415W-Thermal Systems Laboratory 3
ME 441-Heat and Mass Transfer 3
ME 487 W,O-Design Project 3

6. Complete the following M.S. program (major) requirements:

ME F631-Advanced Mechanics of Materials 3
ME F634-Advanced Materials Engineering 3
ME F641-Advanced Fluid Mechanics 3
ME F642-Advanced Heat Transfer 3
ME F608-Advanced Dynamics 3

7. Complete the thesis or non-thesis requirements:

Thesis

Complete the following:

ME F699-Thesis 6

Electives* 9

Non-Thesis

Complete the following

ME F698-Project 3

Electives** 12

*At least 3 credits at the graduate level.

**At least 6 credits at the graduate level.

Electives are ME or other engineering, science, or mathematics courses at F400-level or above approved by the student's advisory committee.

8. A minimum of 150 credits is required for both degrees.

Note: This degree program must be completed in 7 years or the student will be disqualified from the program. If a student is disqualified for exceeding the 7 year limit

for the fast track degree program, a ME B.S. will be awarded if: 1) completed in 10 years, and 2) meet ME B.S .requirements.

Taken separately, the degrees would require 161 credits (131 B.S. and 30 M.S.). The difference of 11 credits comes from the electives of the B.S. program:

- a. Taking the B.S. degree and the M.S. degree separately, the student needs to take 11 elective credits (6 for ME electives, 3 for technical electives, and 2 for free electives) for the B.S. degree, another 9 or 12 graduate elective credits for the M.S. degree for the non-thesis and thesis option, respectively.
- b. Taking the B.S./M.S. degree, the student needs to take 9 or 12 elective credits (for thesis and non-thesis option, respectively) instead of both B.S. elective credits and M.S. elective credits.

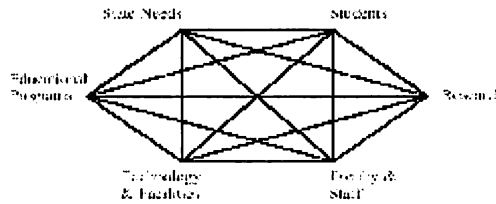
The minimization of overlaps, maximizing the benefits of continuity, and taking graduate level courses in lieu of undergraduate ones justify the reduction.

Resources Requirements

The department had a peak of enrollment of 22 M.S. students in 2003 and 2004 without any issues in resources. Consequently, we are not requesting additional resources for the proposed program.

**University of Alaska Board of Regents
Program Approval Summary Form**

MAU: University of Alaska Fairbanks
**Title: Fast Track Mechanical Engineering
Bachelor/Master Degrees**
Target admission date: Fall 2009



How does the program relate to the Education mission of the University of Alaska and the MAU?

The proposed program aims to fulfill the education mission of the Department of Mechanical Engineering: To offer the highest quality, contemporary education at the undergraduate and graduate levels and to perform research appropriate to the technical needs of the State of Alaska, the nation and the world.

We have discussed the development of the program within the department, faculty staff and students, colleagues at UAF including the Computer Science Department which has a similar program to the one being proposed. Since this is a Mechanical Engineering specific program, there should be no impact on other existing programs.

What State Needs met by this program

The proposed program, through retaining and advanced training of our own excellent undergraduate students, will provide much needed high-quality workforce for the State of Alaska for economic development.

What are the Student opportunities and outcomes? Enrollment projections?

The combined accelerated degree for Mechanical Engineering undergraduate students is designed for excellent students to complete both a Bachelor in Science and a Master in Science in five years. Students receive advanced training by taking graduate level classes and conducting high-level research at a reduced cost and reduced time. The training should enhance the career paths and options of the graduates.

Projected enrollment is 4 to 8 students per year with a maximum of 30 students total.

Describe Research opportunities:

Students will conduct research through either the project or thesis option. There is a wide range of challenging research topics and projects, many are cold-regions related, for the students to choose.

Describe Fiscal Plan for development and implementation:

Existing resources are adequate for the proposed program.