

Contact: Diana Gonzalez

**REQUEST FOR A NEW PROGRAM AT IOWA STATE UNIVERSITY:  
MASTER OF ENGINEERING PROGRAM IN ENGINEERING MANAGEMENT**

**Action Requested:** Consider approval of the request by Iowa State University to establish a new Master of Engineering Program in Engineering Management which will be administered by the Department of Industrial and Manufacturing Systems Engineering (IMSE) in the College of Engineering.

**Executive Summary:** The proposed program will provide an option for students who seek advanced study in engineering to prepare them for leadership/management positions in their organizations. This proposal was reviewed by the Board Office and the Council of Provosts and is recommended for approval. No concerns were raised when it was presented to the Iowa Coordinating Council for Post-High School Education. The proposed program addresses the Board of Regents Strategic Plan priorities to “provide educational excellence and impact as well as economic development and vitality” and Goal #8 – “Iowa’s public universities and special schools shall be increasingly efficient and productive.”

**Background:**

- ◇ **Description of proposed program.** Engineering Management is a unique discipline that uses engineering skills and knowledge to manage large scale projects. It links other types of engineers, including industrial, mechanical, chemical, and electrical, to accomplish organizational results through the leadership of knowledge-workers and the appropriate application of technology.<sup>1</sup> The proposed program will provide the knowledge and skills necessary to manage and develop a highly qualified and trained staff of engineers, scientists, and technicians in a rapidly changing technological environment. Students will demonstrate the following learning outcomes:
- ⇒ Knowledge of the core competencies necessary for effective engineering management.
  - ⇒ Understanding of the management of innovation or entrepreneurship within the organization.
  - ⇒ Knowledge of how to manage engineers/technologists and necessary skills development for engineers.
  - ⇒ Knowledge of the necessary processes, tools, and skills to effectively manage simple and complex projects.
  - ⇒ Ability to investigate and synthesize the needs of marketing, sales, engineering, accounting, finance, manufacturing, and service.
  - ⇒ Ability to implement strategies in light of the legal, regulatory, economic, social, and political contexts of business.
  - ⇒ Understanding of the ethical issues, moral dilemmas, and stakeholder responsibilities embraced by today’s corporate decision makers.

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<sup>1</sup> American Society for Engineering Management.

- ◇ Relationship to existing programs. The proposed program will provide a unique combination of knowledge and skills with a focus not currently offered at ISU. The IMSE department worked closely with the College of Business to develop the program. Fifty percent of the required credits will come from courses offered by the College of Business. Increased collaborations between the two colleges and between faculty are likely to occur after the program is implemented. The College of Business will review and advise the proposed program regarding changes in the curriculum or admissions policies. A minor in engineering management may be developed in the College of Engineering. Its availability to students from any engineering discipline would result in increased cross-disciplinary exposure for students.
- ◇ Duplication. There are no other institutions of higher education in Iowa that offer a Master of Engineering Program in Engineering Management. A similar program is available at a number of universities outside of Iowa, including the University of Pennsylvania, Duke University, Florida Institute of Technology, and Massachusetts Institute of Technology.
- ◇ Student demand. Development of the proposed program was initiated after consulting with numerous industrial partners, including Rockwell Collins and John Deere. The College's industrial partners requested a graduate degree that would provide their engineers the opportunity to gain more general management skills while focusing on the management of technologists. Partner industries have indicated that they will provide student enrollment for the program.
- ◇ Projected enrollment. The projected enrollment is 20 students in Year 1, increasing to 100 students per year by Year 7. The proposed program will be offered primarily through distance education and will appeal to place-bound students. Initially, students will be employees of industrial partners in the state. The history of the Systems Engineering program began with sources from Iowa industry and grew to sources beyond the state borders.
- ◇ Unique features. ISU is well known for the quality of its engineering programs and has one of the largest colleges of engineering in the country. The College of Engineering's reputation is borne out by the size of the engineering career fair each year; it is the largest indoor career fair with more than 270 employers represented. The College has a long tradition of offering distance education courses with an excellent infrastructure in the Engineering Online Learning office. For example, the Master of Engineering Program in Systems Engineering has an enrollment of approximately 100 distance students every year. The College of Business has expanded its distance education efforts; the College of Engineering has worked with the College of Business to offer business courses. Strong ties between the two colleges will provide an excellent environment for the proposed program. Another distinguishing feature of the proposed program is the unique combination of engineering and business courses.
- ◇ Need for proposed program. The American Society of Engineering Management has shown an increased number of students participating in degree programs. The U.S. Bureau of Labor Statistics projects the demand for engineering managers to grow by approximately 6% by the year 2018.

- ◇ Resources. The University anticipates that existing courses will be drawn together for the proposed program. One new course will be developed which will focus on managing engineers, technology, and innovation. Both colleges have the faculty necessary to teach the courses. It is anticipated only one new lecturer or tenure-track faculty member will be needed to teach the new course. The proposed program will be offered primarily through distance education. The courses will be offered through the College's Engineering Online Learning (EOL) facilities. EOL's facilities are excellent for offering distance education courses and have the necessary capacity to handle the additional course load. Many of the courses required for the proposed program are already offered through EOL.
- ◇ Cost. The anticipated new cost for the proposed program is \$41,600 in Year 1, increasing to \$49,673 by Year 7. The total cost for a new faculty line is \$104,000. Forty percent of the new faculty position will be dedicated to teaching the new course and administering the proposed program. The funds for the new faculty line will be reallocated from the College of Engineering.
- ◇ Link to institutional strategic plan. The proposed program will integrate science, technology, engineering, and management. It is congruent with the University's mission to provide a venue for collaboration within the academic community by fostering cross-disciplinary cooperation and outside the University through collaboration with a variety of corporate entities in Iowa and elsewhere. The College of Engineering's mission includes filling the unmet needs for technically educated leadership; and partnering with and increasing the return on investment of stakeholders through a highly educated and valued workforce and improved economic vitality of the state and region. The mission of the Department of Industrial and Manufacturing Systems Engineering is to establish itself as a leader among academic departments of industrial engineering. Offering a program in engineering management will increase the department's visibility with engineers in Iowa and elsewhere and demonstrate leadership in providing a high demand program.