

Contact: Rachel Boon

**REQUEST FOR NEW PROGRAM AT THE UNIVERSITY OF IOWA:  
MASTER OF ENGINEERING AND INFORMATION TECHNOLOGY**

**Action Requested:** Consider approval of the request by the University of Iowa for a Master of Science in Engineering and Information Technology in the Graduate College.

The Council of Provosts and Board office support approval of this program.

**Background:**

**Description of proposed program.** The Master of Science in Engineering and Information Technology (MSEIT) program will require 30 semester hours (10 courses) of graduate-level coursework, from the areas of Electrical and Computer Engineering, Mechanical Engineering, Industrial Engineering and Data Sciences. The program will have a common core with two areas of specialization. Courses will be taught at the Quad-Cities University of Iowa Education Center in central Davenport (Birchwood Learning Center), and will be offered outside of regular working hours (evenings, weekends) to facilitate attendance by students working full- and part-time jobs. The requirements for admission to the program will be a bachelor's degree in engineering or a related field and an undergraduate GPA of at least 3.0. Students whose undergraduate GPA is slightly below 3.0 may be considered for a low GPA petition. We plan to offer two courses per semester, allowing students to complete the program in as little as 5 semesters (2.5 years).

**Academic objectives.** The MSEIT program is intended to provide a rigorous, yet broadly accessible, platform for practicing BS-level engineers and bachelor's-level graduates from other related disciplines to obtain advanced training in contemporary engineering and information technology areas. Rather than narrowly focusing in one area, the program will provide a breadth of exposure to areas that are key to the design, implementation and manufacturing of complex, smart systems. This exposure will include coursework in software engineering, networking, cloud computing, machine learning, robotics, advanced manufacturing, testing/quality assurance and associated legal, regulatory, environmental, security and ethical issues.

**Need for proposed program.** The rapid expansion of computer, information and advanced manufacturing technology throughout all segments of business and industry is creating challenges for companies that seek to keep pace with the latest advancements. The proliferation of "smart" system technologies, fomented by the burgeoning Internet-of-things (IoT), is fostering a need for engineers whose skill-set transcends traditional disciplinary boundaries. Practicing engineers, whose expertise is outside of the computing and information technology area may need to gain additional knowledge in areas such as software engineering, networking, databases and computer security. Likewise, engineers with expertise in traditional computer-related areas may need to broaden their skill-set to include an understanding of IoT, machine-learning and other smart-system technologies and methodologies. This need is particularly acute in areas such as the Quad-Cities which have a concentration of large companies in traditional manufacturing areas such as agricultural equipment, robotics, steel-part manufacturing, machine tool manufacturing, furniture manufacturing (Muscatine, IA), deploying electrical systems, etc.

Since this program's target population is practicing engineers, it is essential that it be conveniently accessible to this constituency. Hence, the MSEIT program will be delivered in Davenport, Iowa in close proximity to a large concentration of Quad-Cities area industries, with courses offered outside of normal working hours.

Link to institutional strategic plan. The proposed program focused on graduate education of the Iowa workforce is fully consistent with the strategic plans of both the University of Iowa and the College of Engineering to “unlock human potential and prepare citizens for the future,” and “invest in graduate and professional student support.”

Relationship to existing programs at the institution. This is a new program. It will not duplicate any existing efforts at the University of Iowa or other Iowa institutions of higher education.

Relationship to existing programs at other colleges and universities. No similar program exists at any other institution of higher education at Iowa. This program is unique in its focus on enhancing the knowledge and skills of practicing engineers and its on-site delivery in the Quad-Cities area.

Unique features. College of Engineering (CoE) at the University of Iowa has strong graduate programs in several engineering disciplines. This program specifically responds to the needs of the Iowa companies in Quad-Cities and their desire for a program in general engineering to allow continuing professional growth of their employees. The broad ability of the University of Iowa CoE to deliver the desired cross-discipline graduate education, and the long-term relationships with the eastern Iowa companies, created an excellent environment to facilitate development of this unique graduate program. It has already received support from a number of eastern Iowa companies, including Arconic, HNI, John Deere, Olympic Steel, Russel, Ryerson, the US Army Corps of Engineers and Vizient. A letter of support from Arconic is attached to this proposal.

Resources to establish a high-quality program. Tenure-track and instructional faculty from the Departments of Electrical and Computer Engineering, Mechanical Engineering, Industrial and Systems Engineering, and Civil and Environmental Engineering will be available to teach the proposed program at the Quad-Cities Birchwood Learning Center. To guarantee the industrial relevance and hands-on aspects of the program, some courses will be co-taught by CoE faculty and outside experts specifically appointed for this purpose as Adjunct Professors of Practice. The teaching ratio will vary course-to-course with expected 67% teaching delivered by full-time CoE faculty and 33% by Adjunct faculty.

Student demand. The program is being established in response to the requests of eastern Iowa companies, including Arconic, HNI, John Deere, Olympic Steel, Russel, Ryerson, and the US Army Corps of Engineers and Vizient. Each noted the expressed interest of their employees to have access to a broad engineering graduate program that would facilitate continuing post-bachelor education in the field.

Workforce need/demand. It is also difficult or impractical for full-time employees of Quad-Cities companies to pursue additional college/university level education since there are currently no on-site, graduate-level engineering programs offered within a 50-mile radius the Quad-Cities area. This leaves on-line programs as the only viable option in most cases. Discussions with area industry indicate a strong preference for an on-site, face-to-face program, taught during non-working hours that would provide consistent, high quality education by highly qualified faculty members. The area industries with short driving distance to Quad-Cities (<30 miles, counties in Iowa and Illinois adjacent to Davenport, IA) currently employ more than 19,000 employees with a BS degree in engineering or in a related field (2016 American Community Survey 5-Year Estimates, U.S. Census Bureau). A conservative estimate that only 0.5% of these employees would be interested in a professional degree program at any given time suggests an enrollment of 95 students/year. The estimates provided by a subset of eastern Iowa identify a likely demand at the sustained level of more than 50 MSEIT students per program offering.

Cost. No additional budget resources are required. The program is designed to be self-sustaining. In particular, all financial costs will be funded using revenue generated by the program. These costs include teaching expenses, faculty travel to Quad Cities, hiring instructional faculty and assume a 3% yearly increase. These costs will be covered by tuition generated directly by this off-campus program.

	<b>COSTS (year 1)</b>	<b>TOTAL COSTS</b>
Program Coordinator	\$40,000	
Part-time Administrator	\$12,000	
Instructor Travel	\$ 12,000	
Facilities Cost	\$25,000	
Adjunct faculty	\$65,000	
Teaching Assistants	\$28,000	
Marketing/Recruiting	\$8,000	
Miscellaneous	\$15,000	
Total Yearly Cost (Year 1)		\$ 205,000
Total Yearly Cost (Year 2)		\$211,150
Total Yearly Cost (Year 3)		\$217,484
Total Yearly Cost (Year 4)		\$224,009
Total Yearly Cost (Year 5)		\$230,729
Total Yearly Cost (Year 6)		\$237,651
Total Yearly Cost (Year 7)		\$259,533

<b>SOURCES</b>	<b>TOTAL AMOUNT</b>
<i>Tuition (Year 1: 360 credit hours at \$1,167/credit hour) (Years 2-7: 480 credit hours @ \$1,167)</i>	Year 1: \$420,000 Years 2-7: 560,000

Projected graduate student enrollment.

	Y 1	Y 2	Y 3	Y 4	Y 5	Y 6	Y 7
Majors	30	40	40	40	40	40	40
Non-Majors	3	3	3	3	3	3	3

Accreditation. There are currently no accreditation efforts specifically focused on graduate engineering programs. However, this program will be housed within the College of Engineering, which has all of its undergraduate programs accredited by ABET (Accreditation Board for Engineering and Technology).

Evaluation plan. The program will be evaluated on a yearly basis as a regular part of graduate program educational evaluation performed by the Department of Electrical and Computer Engineering. Electronic Course Assessment Surveys will be conducted at the completion of each course to assess student perceptions of the appropriateness of course content and instructor effectiveness. In addition, an MSEIT Program Steering Committee will be formed, with membership from companies whose employees are enrolled in the program. This committee will meet annually to assess the degree to which the MSEIT program is meeting industry needs and to propose appropriate adjustments to enhance the effectiveness of the program.

Date of implementation. August 2019

Letters of Support

**IOWA STATE UNIVERSITY**  
OF S C I E N C E A N D T E C H N O L O G Y

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September 7, 2018

John Keller  
Associate Provost for Graduate and Professional  
Education Dean, the Graduate College  
201 Gilmore Hall  
Tel: 319-335-2142

Re: Endorsement of Bachelors of Science degree in Cyber Security

Engineering Dear Associate Provost Keller:

My colleagues and I have reviewed your proposed Master of Science in Engineering and Information Technology at the University of Iowa. Based on our review, the College of Engineering at Iowa State University supports the proposal and has no objections to the degree. We agree that it will meet the needs of industry located in the Quad City area.

We wish you the best with the implementation of the  
program. Sincerely,



Sarah A. Rajala  
James L. and Katherine S. Melsa Dean of Engineering



4879 State Street  
PO Box 3567  
Bettendorf, IA 52722

**ARCONIC**

May 29, 2018

Dr. Milan Sonka  
Associate Dean for Research, Graduate Programs, and Faculty 3100 Seamans Center  
College of Engineering The University of Iowa Iowa City, IA 52242

Re: Professional Master of Science in Engineering and Information Technology (MSEIT)  
Degree Letter of Support

Dear Dr. Sonka:

Thank you for meeting with our team last week and introducing us to the new Master's in Engineering and Information Technology (MSEIT) degree to be offered in the Quad Cities, currently under development at the University of Iowa. We would be very interested in learning more about this program and believe it would be beneficial to our employees and our talent pipeline.

Arconic specializes in lightweight metals engineering and manufacturing. Our Davenport facility is part of Arconic's Global Rolled Products business unit. We focus on bringing cutting-edge advanced manufacturing techniques to all our products and services. Rapidly changing technology is a challenge that we constantly strive to meet through developing a highly trained workforce.

A Master's program offered locally that would provide our employees an opportunity to enhance their skills in emerging technologies would be of great value to our company. Arconic supports the development of this new degree program and looks forward to future conversations about this opportunity for our employees.

Communications & Public Affairs  
Manager Arconic

Sincerely,

John Riches