

THE UNIVERSITY OF MICHIGAN
REGENTS COMMUNICATION

ACTION REQUEST

SUBJECT: New Degree Program

ACTION REQUESTED: Approval of a new interdisciplinary degree program, Doctor of Engineering in Automotive Systems and Mobility, to be offered by the College of Engineering and Computer Science, University of Michigan-Dearborn

EFFECTIVE DATE: September 1, 2019

The College of Engineering and Computer Science (CECS) at the University of Michigan-Dearborn proposes to establish an interdisciplinary graduate program leading to a Doctor of Engineering (D. Eng.) degree in Automotive Systems and Mobility (ASM). The CECS currently offers a master's program and a Ph.D. program in Automotive Systems Engineering (ASE), which were established in 1996 and 2009, respectively. The Ph.D. program in ASE was established as one of the two interdisciplinary Ph.D. programs in the college with support from all four departments: Computer and Information Science, Electrical and Computer Engineering, Industrial and Manufacturing Systems Engineering, and Mechanical Engineering. In 2017, all four departments in CECS launched four new Ph.D. programs to meet the growing needs of the society for highly educated professionals capable of conducting research and development in their respective disciplinary areas, i.e. Ph.D. in Computer and Information Science, Electrical and Computer Engineering, Industrial Systems Engineering, and Mechanical Sciences and Engineering. In 2018, the four Ph.D. Programs were accepted by the Rackham Graduate School at the University of Michigan. Following the practices of Rackham Graduate School, all four Ph.D. programs will only admit qualified full-time Ph.D. students.

The new doctoral degree program is designed to serve the needs of working engineering professionals by providing them with the education and training in advanced technologies and research skills necessary for solving the challenging problems in the automotive and mobility industry in the 21st century. It centers on engineering practice and application, problem solving skills, and innovations, and preparing graduates for technical leadership roles in automotive and mobility industry. The proposed D. Eng. in ASM program will be uniquely important to the state of Michigan as it is the only doctoral program to serve specifically for the automotive and mobility industry.

Rapid advancement in internet, data science, artificial intelligence, and mobile technologies are fueling the revolutionary change in vehicles and mobility industry in the 21st century. Mobility can be simply defined as the ability or means to move people, goods, or services effectively, efficiently, and easily between different locations, regions and levels in society. The automotive and mobility industry in Michigan expect their workforce to be well educated in modern automotive engineering and mobility technologies, and well trained in problem solving skills and research capabilities through high-level education. For a number of years, the members of the


Visiting Committee of the college, representing industry leaders from automotive companies, Tier 1 suppliers, and other local companies, have pointed out that there is an increased need for professionals educated beyond the master's level who are capable of serving as technical leaders, innovators, and mentors in their companies. For many engineers, this requires an education beyond the master's degree and, more specifically, in the niche or specialized areas of emerging technology that can best be offered through doctoral programs.

The automotive and mobility industry has a large demand on technical specialists to carry out translational research, develop innovative prototypes of advanced hardware and software systems, and integrate emerging technologies to make new products, which may require the knowledge in many different disciplines, including vehicle safety and environmental regulations, electric and alternative powertrains, autonomous vehicles, intelligent control systems, telematics, new materials, lightweight materials, multimodal transportations, operational logistics, shared mobility related technologies, big data and cybersecurity. Thus, the research engineers and technical leaders in automotive and mobility related companies must acquire specialized research skills and interdisciplinary knowledge that are not usually provided by the Ph.D. programs in traditional engineering disciplines.

The college has more than 80 tenured and tenure-track faculty members, growing student enrollment, and adequate research expenditures to support the D. Eng. in ASM program. In rapidly changing fields such as engineering and computer science, high-quality teaching demands that faculty members stay at the cutting edge of the technologies in their fields. The establishment of the proposed doctoral program will lead to more research funding from industry, federal, and state agencies, through strong connection with industry and collaborative translational research activities among faculty of multidisciplinary areas.

The dean, the Executive Committee, and the governing faculty of the College of Engineering and Computer Science have approved the Doctor of Engineering in Automotive Systems and Mobility. The CECS Administrative Council, and the Graduate Curriculum Committee at the University of Michigan-Dearborn have also extended their approval. We request that the Regents approve the offering of the new interdisciplinary degree program, Doctor of Engineering in Automotive Systems and Mobility. Pending approval, the first students will enter the program in September of 2019, following further approval from the Michigan Association of State Universities.

Recommended by:



Domenico Grasso, Chancellor
University of Michigan-Dearborn

February 2019