

MS IN ENGINEERING: MOBILITY SYSTEMS

Home Department: Industrial and Manufacturing Engineering

Available: On Campus Only

Program Directors:

Dr. Javad Baqersad, jbaqersad@kettering.edu

Dr. Girma Tewolde, gtewolde@kettering.edu

Program Overview

The Master of Science in Engineering is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

The **Mobility Systems** program (formerly Automotive Systems) is intended for individuals who desire a deeper understanding and knowledge of mechanical, electrical, computer, and industrial systems used in automotive vehicles and their manufacture. Courses cover subjects such as conventional and electric propulsion systems, vehicle safety systems including connected and autonomous vehicle systems, and modern automotive manufacturing systems. Students select courses from a structured framework in order to customize a program that best meets their individual and career needs.

To receive the M.S. degree a student in the graduate program must complete a minimum of 40 credit hours of graduate work. There are two options to choose from:

- Thesis Option (consists of course work, research, and a thesis)
- Non-thesis Option (consists of only course work)

Accelerated Masters (BS/MS) Program

The MSE-Mobility Systems program is eligible for the Accelerated Masters Program. Kettering University undergraduate students electing to continue their studies may apply up to 12 credits of qualifying 400-level courses completed as an undergraduate. For more information see: <http://catalog.kettering.edu/grad/programs/acceleratedmasters/> or contact the program advisor.

SAE/Kettering University Partnership

Students who have up to eight (8) Continuing Education Units (CEU) from approved SAE seminars may be eligible to transfer those CEU's into the Mobility Systems Masters program. For more information, contact the program advisor.

Program Curriculum Requirements

Completion of 40 credits as follows:

Program of Study

Code	Title	Credit Hours
Required Courses		
Mobility Principles: Students with a single undergraduate engineering major take the two "Principles" courses that are outside of their Undergraduate major. Students with dual undergraduate majors take the one "Principles" course outside of their dual major and one additional elective course.		8
ECE-601	ECE Principles for Mobility	
IME-601	IME Principles for Mobility Systems	
MECH-601	ME Principles for Mobility Systems	
ECE-610	Modeling of Dynamic Systems	4
Electives		28
Thesis Option: Select five electives from the approved lists & complete an 8 hour Thesis		
Non-Thesis Option: Select seven electives from the approved lists.		
Total Credit Hours		40

Electives offered by the Department of Electrical and Computer Engineering

(Course prerequisites must be observed.)

Code	Title	Credit Hours
CE-620	Microcomputer Systems	4
CE-626	Real-Time Embedded Systems	4
CE-642	Mobile Robotics	4
CE-651	Introduction to Autonomous Driving	4
CE-652	Artificial Intelligence for Autonomous Driving	4
CE-654	Computer Vision for Autonomous Driving	4
CE-672	Virtual Reality Systems: M&C	4
CE-680	Computer Networks	4
CE-684	Internet of Things (IoT)	4
EE-621	Energy Storage Sys w/ EV App	4
EE-626	Power Electronics for Vehicle Electrification	4
ECE-630	Digital Signal Processing Techniques for Automotive Engineering	4
ECE-632	Automotive Control Systems	4
ECE-642	Machine Drives for Electric Vehicles	4
ECE-648	Electromagnetic Compatibility	4

Courses Offered by the Department of Industrial and Manufacturing Engineering

(Course prerequisites must be observed.)

Code	Title	Credit Hours
IME-453	Supply Chain Design	4
IME-473	Design of Experiments	4
IME-603	Numerical Control Machining	4

IME-608	Industrial Robotics	4
IME-622	Simulation	4
IME-652	Production System Design	4
IME-662	Ergonomics	4
IME-663	Safety & Human Factors	4
IME-671	Quality Assurance	4
IME-672	Reliability & Maintainability	4
IME-676	Lean Six Sigma	4
IME-680	Computer Integrated Manufacturing	4

Electives Offered by the Department of Mechanical Engineering

(Course prerequisites must be observed)

Code	Title	Credit Hours
MECH-426	Fuel Cell Science and Engineering	4
MECH-440	Introduction to Internal Combustion Engines	4
MECH-442	Chassis Systems	4
MECH-446	Vehicle Systems Dynamics	4
MECH-451	Vehicular Crash Dynamics and Accident Reconstruction	4
MECH-613	Nonlinear Finite Element Analysis	4
MECH-615	Engineering Optimization	4
MECH-641	Advanced Auto Power Systems	4
MECH-643	Noise, Vibration & Harshness	4
MECH-644	Introduction to Automotive Powertrains	4
MECH-645	Hybrid Electric Vehicle Propulsion	4
MECH-646	Advanced Vehicle Dynamics	4
MECH-647	Combustion & Emissions	4
MECH-650	Automotive Bioengineering: Occupant Protection and Safety	4

Internships

(With approval of a faculty advisor)

Code	Title	Credit Hours
ENGR-693	Internship in Engineering	4