

The Minor in Mechatronics

Advancements in power electronics, electronic sensors, and computer hardware and software have led to an expanding role for "smart" systems, which combine electronic and mechanical components. Automotive examples illustrate this point. The replacement of carburetors by fuel injection systems is almost universal, and hybrid/electric cars are replacing traditional automobiles. Not only are auxiliary devices such as fuel pumps, air bags and air-conditioner compressors driven by electric motors controlled by microprocessors, but fundamental components such as intake and outtake valves soon will be driven in this way. The internal combustion engine itself may be replaced by fuel cells and motors. Medical devices, micro-electromechanical systems, robots, fly-by-wire aircraft and wind turbines also all rely on electronic sensing of mechanical parameters and actuation of motion. These examples suggest strongly that engineers who are adept in the design, analysis and simulation of electromechanical systems will be in demand. The minor in mechatronics is created to encourage our students to study this important subject and provide recognition to those who do so.

This program is primarily designed for students in the ESE and MEMS departments and has been approved by the two departments. It is available for others as well.

The proposed minor program consists of four required courses, two electives and one prerequisite:

Four required courses:

Code	Title	Units
MEMS 255	Dynamics	3
MEMS 411	Mechanical Engineering Design Project (mechatronics project)	3
ESE 444	Sensors and Actuators	3
ESE 446	Robotics: Dynamics and Control	3
Total Units		12

Two electives chosen from the following:

Code	Title	Units
MEMS 4301 or ESE 441	Modeling, Simulation and Control Control Systems	3
MEMS 4310	Dynamics and Vibrations	3
ESE 436	Semiconductor Devices	3
ESE 482	Digital Signal Processing	3

Prerequisite:

Code	Title	Units
CSE 131	Introduction to Computer Science (basic programming course)	3

For more information about the minor, contact Dennis Mell (<https://engineering.wustl.edu/faculty/Dennis-Mell.html>) (ESE) or Jackson Potter (<https://engineering.wustl.edu/faculty/Jackson-Potter.html>) (MEMS).