Mechanical Engineering (MECH)

Courses

MECH 302 Introduction to Robotics 3 Credits (3,0)
This course is an introduction to robotics with emphasis on the mathematical tools for kinematics and dynamics of robot arms. Topics include the geometry and mathematical representation of rigid body motion; forward and inverse kinematics of articulated mechanical arms; trajectory generation, splines, interpolation; manipulator dynamics; position sensing and actuation; and an introduction to topics in manipulator control and computer vision.
Prerequisites: ENGL 221 and ESCI 204 and ELEC 230 and ELEC 231 and CESC 220 and CESC 222 **Corequisites:** MECH 303

MECH 303 Robotics Laboratory 1 Credit (0,1)
This course is lab part of the introduction to robotics with emphasis on hands-on experience of embedded microcontroller unit and emulation of serial robotic systems. Topics include the programming skills of microcontroller unit used for robotic systems; coding MCU for sensors and actuators; forward and inverse kinematics of articulated mechanical arms; and trajectory generation and interpolation.
Corequisites: MECH 302

MECH 313 Instrumentation and Data Acquisition 2 Credits (2,0)
This course will be a combination of theoretical and applied topics related to instrumentation, data acquisition, and hardware interfacing with mechatronic systems. This course covers aspects related to interfacing sensors and actuators with computers including sampling rates; sources of error and time delay; analog and digital signal conditioning circuits; and the influence of EMI, grounding, and noise in the power supply. Students will be exposed to data acquisition and control software (e.g., LabVIEW).
Prerequisites: ELEC 230 and ELEC 231 and CESC 220 and CESC 222
Corequisites: MECH 314

MECH 314 Instrumentation and Data Acquisition Laboratory 1 Credit (0,1)
This course is the lab companion for MECH 313, and aims to provide hands-on experience emphasizing measurement and instrumentation concepts, sensor operations, and computer-based data acquisition and analysis. Specifically, students will build data acquisition system based on LabVIEW and myDAQ to collect and analyze data from commonly used sensors for measuring temperature, pressure, and displacement, etc.
Prerequisites: ELEC 230 and ELEC 231 and CESC 220 and CESC 222
Corequisites: MECH 313