

1. *Course number and name*

**ENGR 415: Mechatronics**

2. *Credits and contact hours*

3 Credit Hours , 3 hours of lecture per week.

3. *Instructor's or course coordinator's name*

Instructor: M. Azadi, Assistant Professor of Mechanical Engineering

Course coordinator: M. Azadi, Assistant Professor of Mechanical Engineering

4. *Text book, title, author, and year*

*Mechatronics: Electronic control systems in mechanical and electrical engineering (5th or 6th Edition)* by W. Bolton. (ISBN-13: 978-0273742869)

a. *other supplemental materials*

- *Introductions to Mechatronics and Measurement Systems 3rd Editions*, by David G. Alcaitore and Michael B. Hstand, McGraw Hill, 2007. (ISBN 0-07-296305-0)

5. *Specific course information*

a. *brief description of the content of the course (catalog description)*

Introduction to Mechatronics systems, sensors and actuators. Basics of a multidisciplinary field that combines electronics, mechanical design and simulation, and control systems. Simulation and design of systems with sensors, controllers and actuators. System elements including common sensors, actuators and various electronic controllers.

b. *prerequisites or co-requisites*

ENGR 305.

c. *indicate whether a required, elective, or selected elective course in the program*

Elective for Electrical and Mechanical Engineering.

6. *Specific goals for the course*

a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

- The student will demonstrate knowledge of common sensor.
- The student will demonstrate a knowledge of common actuators.
- Students will be able to design simple linkage and gearing for actuation.
- The student will demonstrate a knowledge of hydraulic and pneumatic.
- The student will be able to recognize and select basic Mechanical component for design.
- The student will be able to write a ladder logic program for a PLC and understand how to integrate a PLC into a mechatronic system.

*b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, c, d, e, i, k.

*7. Brief list of topics to be covered*

- Introduction to Mechatronics System— Control Architectures and Case Studies
- Mechanisms
- Mechanical components
- Electrical components
- Range of Actuators (Pneumatic, Hydraulics, Electrical)
- Range of sensors and Transducers
- Range of controller (such as Micro controllers, PLC)