1. Course number and name
ENGR 416: Mechatronics Lab

2. Credits and contact hours
1 Credit. one three-hour session/week

3. Instructor's or course coordinator's name
Instructor: George Anwar.
Course coordinator: M. Azadi, Assistant Professor of Mechanical Engineering

4. Text book, title, author, and year

None required

    a.   other supplemental materials
        Bolton, W.,Mechatronics,6th Edition. Addison Wesley Longman Publishing, New York, NY, 2015. (Optional References).

5. Specific course information
    a. brief description of the content of the course (catalog description)
    Experiments connected with mechatronic concepts. Programming robot tasks. Comparison and analysis of human and robot motion. Optical encoders, motor selection and tuning.

    b. prerequisites or co-requisites
    ENGR 415.

    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.

- Students will learn how to use sensor outputs to the range needed by common controllers. Students will learn when the amplification of RC or active filters are necessary for sensor use.
- Students will learn how to program an 8-bit Atmel microcontroller using the gnu c compiler and a bootloader, and how to debug the program using the atmel simulator.
- Students will learn how to write a ladder-logic program and run it on the school's PLC systems.

    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, b ,c ,d ,k.

7. Brief list of topics to be covered

- Sensors, amplification and filters.
- Microcontrollers(Atmel) in control and automation.
- Use of PLCs for mechatronic systems.
- Motors: DC Motors, stepper motors, hobby servo motors.