BAKER COLLEGE
STUDENT LEARNING OUTCOMES

ME 4870 Mechatronics
3 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Explain mechatronic systems and their applications
    a. Describe the components of a mechatronic system
    b. Describe examples of real-world mechatronic systems
2. Explain microcontrollers
    a. Distinguish microprocessors and microcontrollers
    b. Describe the components of a microcontroller
    c. Program a microcontroller to perform basic functions
3. Examine data acquisition and microcontroller interfacing
    a. Explain characteristics of analog/digital and digital/analog converters
    b. Describe various interfaces: parallel, serial, SPI, I2C, USB
4. Examine sensors, their performance and uses in mechatronic systems
    a. Explain the operation of different types of sensors
        i. displacement
        ii. proximity
        iii. speed
        iv. temperature
        v. vibration
        vi. other sensors
    b. Interpret sensor performance specifications
    c. Select appropriate sensors for specific applications
5. Examine actuators, their performance and uses in mechatronic systems
    a. Explain the operation of DC, AC, stepper and servo motors
    b. Interpret the torque-speed characteristics of an actuator
    c. Select an appropriate actuator for a specific application
6. Apply mechatronics concepts in experimental settings
    a. Test components of mechatronic systems, sensors and actuators, and program microcontrollers
    b. Complete a project involving a mechatronic system with the above components

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These SLOs are not approved for experiential credit.

Effective: Spring 2018