Template for ABET course syllabi (new format)

1. Course number and name
   ENGR 416 – Mechatronics Lab

2. Credits and contact hours
   1 Credit.

3. Instructor’s or course coordinator’s name
   Instructor: Phil Frances.
   Course coordinator: V.Krishnan, Professor of Mechanical Engineering

4. Text book, title, author, and year
   a. other supplemental materials
      (Optional References).

5. Specific course information
   a. brief description of the content of the course (catalog description)

   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.
      • Students will learn how to create a simulink block diagram with DSPACE inputs and outputs, and implement a control law using the DSPACE system and matlab.
      • Students will control the various motors using the controllers (Micro, PLC or PC) from the previous labs.

   explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
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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.
   • Personal computers (DSPACE) for control and automation.
   • Motors: DC Motors, stepper motors, hobby servo motors.