1. **Course number and name:** MECH 2342: Electro-Mechanical Systems

2. **Credits and contact hours:** 3 SCH

3. **Instructor’s or course coordinator’s name:** M. Abed, A. Khan

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

5. **Specific course information**
   
   a. **brief description of the content of the course (catalog description):** Fall 2012 UTEP catalog description: Basic, automated, and advanced manufacturing concepts. Shop demonstration and practices.
   b. **prerequisites or co-requisites:** MATH 1312: Calculus II
   c. **indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program:** Required.

6. **Specific goals for the course**
   
   a. **specific outcomes of instruction:**
      
      At the end of this class the typical students should be able to:
      
      - Analyze simple DC circuits using ohm’s law, Kirchhoff’s current and voltage laws.
      - Analyze DC circuits containing independent sources using node-voltage & mesh-current methods.
      - Understand difference between ideal sources and practical sources.
      - Understand Thevenin and Norton equivalent circuits, superposition, and source transformation techniques.
• Analyze steady state response of basic AC circuits.
• Understand logic circuits.
• Understand fundamental properties of three-phase power.
• Gain basic insight into transformer fundamentals, electric motors and generators.
• Understand the principles of sensing, actuation, and controls.

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

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<th>Student Outcomes</th>
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7. Brief list of topics to be covered:
   • Definition of voltage, current, and Ohm’s law and resistance, and Kirchhoff’s law.
   • Resistive circuits
   • Inductance and capacitance
   • First order circuits
   • Steady-state analysis
   • Introduction to logic circuits
   • Instrumentation
   • Semiconductors (diodes, op amps)
   • Magnetic circuits
   • DC Machines
   • AC Machines
   • Introduction to mechatronics: sensors and actuators