1. **Course number and name**  
   **EML 4930 Modeling and Simulation**

2. **Credits and contact hours**  
   3 cr, 2.5 contact hours (2 hrs. 30 min. lecture)

3. **Instructor’s or course coordinator’s name**  
   Instructor: Dr. Patrick Hollis, Coordinator: Dr. Jonathan Clark

4. **Text book, title, author, and year**  
   None Required

   **a. References:**  
   - Numerical Methods, Dahlquist, G. and Bjorck, A., 1974

5. **Specific course information**  
   a. **brief description of the content of the course (catalog description)**  
      Introduction to various concepts of modeling and simulation of mechanical systems: models of systems, numerical solution of ODEs, software tools for modeling and simulation of complex mechanical systems.

   b. **prerequisites or corequisites**  
      Prerequisites: EML 3014C, EML 3018C

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

6. **Specific goals for the course**  
   a. **Course Outcomes**  
      By the end of the course, a student should be able to:
      1. Model simple jointed systems [1]
      2. Simulate simple jointed systems [2]
      3. Model and simulate other systems in mechanical engineering [1, 2]
      4. Model simple systems using multiple techniques [3]
      5. Simulate various mechanical systems [4]

      Numbers refer to Course Objectives below, e.g. for course outcome 3, [1,2] refers to course objectives 1 and 2.

   b. **Course Objectives and Relation to Student Outcomes**  
      1. Model various mechanical systems [5, 10]
      2. Simulate various mechanical systems [5, 10]
      3. Choose appropriate modeling techniques [5]
      4. Use suitable simulation techniques, and understand various parameters in simulation techniques [5, 10]
      5. Model and simulate complex mechanical systems using multiple tools simultaneously [5, 10].

      Numbers refer to Departmental Student Outcomes, e.g. for course objective 1, [5, 10] refers to student outcomes 5 and 10.

7. **Brief list of topics to be covered**

Submitted for ABET Review October 5, 2015
• Modeling of Mechanical Systems
• Simulation of Mechanical Systems
• Solution of ODEs
• Modeling and Simulation techniques and software
• Complex Systems