EGN 4432 Dynamic Systems
ABET Course Syllabus

1. **Course number and name**: Dynamic Systems/EGN 4432

2. **Credits and contact hours:** 3 credits / Two 80 minute lectures each week

3. **Instructor's or course coordinator's name:** Dr. An

4. **Text book, title, author, and year:** System Dynamics, 2nd or 3rd edition, William Palm III, McGraw Hill, 2014.

5. **Specific course information:**

   (a) Brief description of the content of the course (catalog description): Acquaints students with basic knowledge about dynamic systems, systems stability analysis and basic controller design.

   (b) Prerequisites: EGN 3321 - Dynamics or equivalent, EGN 2213 Computer Applications in Engineering I, MAP 3305 – Engineering Mathematics I or MAP 2302 Differential Equations I (all with a grade of C or above).

   (c) Indicate whether a required, elective, or selected elective course in the program: Required

6. **Specific goals for the course:**

   (a) Specific outcomes of instruction (course specific objective): Acquaints students with basic knowledge about dynamic systems, systems stability analysis and basic controller design.

   (b) Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. The learning outcomes of the course (and related ABET Criterion 3) outcomes are:

      1. A basic knowledge of the fundamental principles governing the dynamics of simple mechanical, thermal, fluid and electrical systems. (a,e/1)
      2. An ability to apply the knowledge of mathematics and engineering to model simple dynamic systems. (a,e/1)
      3. An ability to simulate dynamic systems using computer simulation tools. (a,e,k/1,2,6)
      4. An ability to characterize the stability properties of a dynamic system. (a,e,k/1,2,6)
      5. An ability to design a simple feedback control system that meets desired system output specifications. (a,c,e,k/1,2,6)

7. **Brief list of topics to be covered:**
   - Block Diagrams
   - Matlab / Simulink Usage for System Analysis
   - Transient and Steady State Responses
   - Stability Analysis
   - PID Control
   - Linearization
   - Numerical Analysis
   - Modeling of Dynamic Systems (DC Motor, Mechanical Systems, Thermal Systems, Fluid Systems)