1. *Course number and name*
   ENGR 306: Electromechanical Systems

2. *Credits and contact hours*
   3 Credits

3. *Instructor's or course coordinator's name*
   Instructor: Jin Ye, Ph. D.
   Course coordinator: Jin Ye

4. *Text book, title, author, and year*
   P.C. Sen, *Principles of Electric Machines and Power Electronics*, 2d ed, Wiley

   a. *other supplemental materials*
      S.Chapman, Electric Machinery Fundamentals

5. *Specific course information*
   a. *brief description of the content of the course (catalog description)*
      Magnetic circuit. Operating characteristics of transformers. Principles of electromechanical energy conversion. DC machines, induction machines, and synchronous machines. Control of electric machines.

   b. *prerequisites or co-requisites*
      A grade C or better in 205

   c. *indicate whether a required, elective, or selected elective course in the program*
      Required for Electrical Engineering, Elective for Computer and Electrical 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.*
   1. The students will demonstrate their understanding of magnetics.

   2. The students will demonstrate their ability to analyze magnetic circuits.

   3. The students will demonstrate their ability to analyze AC circuits

   4. The students will demonstrate their understanding about transformers.

   5. The students will demonstrate their understanding of electromechanical energy conversion principles.

   6. The students will demonstrate their understanding about DC machines.

   7. The students will demonstrate their understanding about induction machines.

   8. The students will demonstrate their understanding about synchronous machines.

9. The students will demonstrate their ability to use MATLAB to solve equivalent circuit parameters of transformers and electric machines.

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*
   Course addresses ABET Student Outcome(s): a, b, c, k

7. *Brief list of topics to be covered*
   1. Magnetic Circuit Analysis

   2. Operational Characteristics of Transformers

   3. Principles of Electromechanical Energy Conversion

   4. DC Machines

   5. Induction Machines

   6. Synchronous Machines