1. *Course number and name*
   Engr 205 Electric Circuits

2. *Credits and contact hours*
   3 Credits

3. *Instructor's or course coordinator's name*
   Instructor: John Kim, Ph.D
   Course coordinator: Hao Jiang, Associate Prof. in EE

4. *Text book, title, author, and year*
   S. Franco, *Electric Circuits Fundamentals*, Oxford University Press, 1995.

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

      Circuit analysis, modeling, equivalence, circuit theorems. Ideal transformers and operational amplifiers. Transient response of 1st-order circuits. AC response, phasor analysis, AC impedance, AC power.

   b. *prerequisites or co-requisites*
      PHYS 230 and MATH 245; MATH 245 may be taken concurrently.

   c. *indicate whether a required, elective, or selected elective course in the program*
      Required for Civil, Electrical, Mechanical and Computer 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.*
      - The student will demonstrate an ability to formulate circuit equations and solve for multiple unknowns.
      - The student will demonstrate an ability to perform transient analyses of 1st-order circuits.
      - The student will demonstrate an ability to extend resistive-circuit analysis techniques to AC circuits using phasor algebra.
      - The student will demonstrate an understanding of the *i-v* characteristics of sources and basic *R*, *L*, and C elements, their idealized models, and the practical limitations of such models.

- The student will demonstrate knowledge of how to apply ideal transformer and op amp models to the analysis of basic circuit configurations.
- The student will demonstrate knowledge of how to apply circuit reduction techniques to simplify circuits or portions thereof.
- The student will demonstrate an understanding of terminology, concepts, and methodology common to engineering.
- The student will demonstrate an ability to apply a structured methodology to solve analytical as well as design-oriented problems.
- The student will demonstrate an ability to recognize inadmissible circuit configurations and unrealistic results.

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,c].

7. Brief list of topics to be covered

- Electricity, signals, and circuits
- Circuit analysis techniques
- Network theorems and circuit modeling
- Dependent sources, ideal transformers, amplifiers
- Op amps and basic instrumentation applications
- Energy-storage elements
- Natural, forced, transient, and steady-state responses
- Phasor algebra, impedance, and AC circuit analysis
- Power calculations