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**

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**
   c. 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.

d. 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