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**
   
   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