CEEN2130 Electrical Circuits I

Fundamental of electrical circuit analysis; Ohm's law and Kirchoff's laws, circuit theorems. Analysis of ciruits with resistive and energy storage elements. DC and transient responses. Computer analysis and simulation of electrical circuits.

1. Instructor: Dr. Lim Nguyen, EN 239, ext. 4-2752, nguyenl@unomaha.edu; office hrs TBD.

2. Text: J. D. Irwin, *Basic Engineering Circuit Analysis,* 5th edition, Prentice-Hall 1996.

3. Reference: Marc E. Herniter, *Schematic Capture with MicroSim PSpice,* 3rd edition, Prentice-Hall 1998.

4. Problem sets: there will be approximately 10 problem sets assigned weekly and due the following week in class. Late turn-in (within 1 week of due date) without prior arrangement will be 50% off; no credit after 1-week late. Discussion and collaboration are strongly encouraged. However, you must turn in solutions of your own (no division of work!).

5. Exams: three hourly exams and one final exams, take home or in-class TBD.

6. Grading: problem sets 40%, exams 30%, final 30%.

7. Course outline:

   - Basic concepts of electrical quantities and sources.
   - Fundamental techniques of circuit analysis; Ohm's laws and Kirchoff's laws. Simple resistive circuits: single loop, single node-pair, series and parallel combination, wye-delta transformation.
   - Nodal and loop analysis, op-amp circuits.
   - Computer analysis and simulation of electrical circuits with PSpice.
   - Additional analysis techniques: linearity and superposition, source transformation, Norton and Thevenin equivalent circuits, maximum power transfer condition.
   - Circuits with energy storage elements: capacitor and inductor.
   - RC/LC circuits and 1st-order transient response.
   - RLC circuits and 2nd-order transient response.
   - Extra element theorem; steady-state AC and frequency response analysis; network analysis with Laplace transform (time permitted)