Electrical Engineering 2100: Circuits I
Prior Number - Electrical Engineering 151

Credit and Contact Hours
3 credit hours lecture (Three 50-minute sessions per week are typical). The accompanying laboratory is Electrical Engineering 2101 (152).

Instructor
Varies: D. DuBroff, Ph.D.; C. H. Wu, Ph.D.; B. Shrestha, Ph.D.; T. Swift, Ph.D., and T. Odu-Ayo, Ph.D.

Text(s)

Course Information
Course Description
Circuit elements, signals, Kirchhoff’s laws, network transforms, mesh and node analysis, transient and complete response of RL, RC, and RLC circuits.

Prerequisites
Math 1215 (15) with a grade of “C” of better. Students should enroll in Electrical Engineering 2100 (151) and Electrical Engineering 2101 (152), simultaneously.

Required or Elective
Required for electrical or computer engineering majors

Course Goals
General Outcomes
1. Understand the behavior of basic circuits elements and basic circuits
2. Learn to apply the fundamental network laws for circuit analysis
3. Learn to simplify linear circuits and to represent circuit signals
4. Introduce the analysis of transient and complete response in first-order and second-order circuits
### Relationship of Course to Program Outcomes

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<th>ECE Outcome</th>
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<td>a</td>
<td>S S S S S</td>
<td>Application of concepts in mathematics and physics</td>
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<td>Key laws and relationships for networks and circuits</td>
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<td>Fundamental topics and concepts in electrical engineering</td>
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S – strong connection; M – medium connection; W – weak connection

### Topics Covered

1. Units, Charge, Current, Voltage, Work, and Power (1/2 week)
2. Kirchhoff’s Current and Voltage Laws and Types of Sources (1 week)
3. Resistance, Capacitance, and Inductance (1/2 week)
4. Parallel and Series Circuits, Current Dividers, and Voltage Dividers (1 week)
5. Review of Simultaneous Equations (1 week)
6. Network Analysis by Node Voltages and Mesh Currents (1 1/2 weeks)
7. Linearity, Superposition, Thevenin’s Theorem, and Norton’s Theorem (2 weeks)
8. Signals, Average Values, and RMS Values (1 1/2 weeks)
9. First-Order Circuits (2 weeks)
10. Second-Order Circuits (2 weeks)
11. Reviews, Examinations, and Final Examination (2 weeks)