

# ECE 211 Syllabus

**Course:** ECE 211  
**Credit Hours:** 4  
**Course Title:** Electric Circuits  
**Course Description:**

Introduction to theory, analysis and design of electric circuits. Voltage, current, power, energy, resistance, capacitance, inductance. Kirchhoff's laws node analysis, mesh analysis, Thevenin's theorem, Norton's theorem, steady state and transient analysis, AC, DC, phasors, operational amplifiers, transfer functions.

**Prerequisite(s):** Grade of C- or better in ECE 200; Co-Requisite: ECE 220

**Textbook(s) and/or other required material:**

Fundamentals of Electric Circuits, 2nd Edition, Charles K. Alexander and Matthew N.O. Sadiku, 4th Edition, McGraw-Hill, 2009

**Course objectives. By the end of this course, the student should be able to (use demonstrative verbs):**

(1) Explain the concepts and parameters associated with: voltage, current, power, energy, resistance, capacitance and inductance. (2) Apply Kirchhoff's laws, linearity, superposition, and Thevenin's theorem in the design and analysis of circuits. (3) Analyze AC circuits involving active circuit elements and elementary amplifiers. (4) Determine the transient response of energy storage elements using periodic functions, RMS values and phasors. (5) Demonstrate the ability to analyze sinusoids in steady-state response, resonance, Q, and bandwidth. (6) Graph the frequency response of the circuits.

**Topics covered:**

Fundamental Laws (3), Nodal Analysis (2), Mesh Analysis (1), Theorems (3), Op Amps (1), Capacitors and Inductors (1), First Order Circuits (3), Second Order Circuits (4), Sinusoids and Phasors (1), Single Phase Power (3), Three Phase Power Circuit Analysis (3), Mutual Inductance (1), Transformers (1), Frequency Response (7), Two Port Networks (2).

**Class/laboratory schedule (sessions per week and duration of each session):**

Three 50-minutes lectures/week, one 110-minutes problem laboratory/week

**Contribution of course to meeting the requirements of Criterion 5 - other:**

Upon successful completion of this course students will be able to perform design and analysis of a/c and d/c. circuits.

**Contribution of course to meeting the requirements of Criterion 5 - math and basic sciences:**

1 hour

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**Contribution of course to meeting the requirements of Criterion 5 - engineering topics:**

3 hours

**Contribution of course to meeting the requirements of Criterion 5 - general education:**

## **Relationship of this course to program learning outcomes:**

<b>Learning Outcome</b>	<b>Level of Instruction</b>	<b>Related Course Content</b>
Outcome A	Major	Students learn the fundamental laws associated with circuit analysis and apply them to the design and analysis of circuits. This includes nodal analysis, mesh analysis, Ohm's law, power analysis, and transient and steady state frequency response.
Outcome B	Intermediate	Students attend problem sessions where they receive additional instruction related to analysis and design.
Outcome C	Basic	Students are required to design and analyze circuits.
Outcome D	N/A	Students work in teams of 2-4 on both homework and design problems in their problem labs.
Outcome E	Major	Students solve circuits problems, characterize their behavior, study their frequency response.
Outcome F	Basic	Students are introduced to basic concepts of personal accountability, professional ethics and

**Relationship of this course to program learning outcomes:**

<b>Learning Outcome</b>	<b>Level of Instruction</b>	<b>Related Course Content</b>
Outcome G	N/A	appropriate team interactions.
Outcome H	N/A	
Outcome I	Basic	Students are expected to use web-based resources of nationally recognized colleges and universities to augment their in-class instructions.
Outcome J	N/A	Students learn circuit analysis techniques throughout the semester.
Outcome K	Intermediate	

**Person who last prepared this description and date of preparation:**

- Ozturk, Hatice Orun (hoo) - Apr 1st, 2010 (02:43pm)