



## JOHN CABOT UNIVERSITY

COURSE CODE: ENGR 227  
COURSE NAME: "**Basic Circuits**"  
Summer Sample Syllabus

**TOTAL NO. OF CONTACT HOURS:** 60 (45 lecture and 15 lab)

**CREDITS:** 3

**PREREQUISITES:** Physics (Electricity & Magnetism), Calculus II. Co-requisite:  
Differential Equations

**OFFICE HOURS:**

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### COURSE AIMS:

This course serves as an introduction to circuit analysis. Beginning with fundamental electronic components, students learn the basics of electrical circuits, including their design and analysis. Both DC and AC circuits will be studied, along with digital logic and operational amplifier circuit topologies. A design project will also be incorporated to allow students the opportunity to create their own circuit using available components.

### SUMMARY OF COURSE CONTENT:

Students will learn about the static and dynamic behavior of resistors, capacitors, and inductors; the types of electrical energy sources used, and the rules used to analyze electrical circuits. They will also learn how to analyze DC and AC circuits for power flow and response characteristics, how to analyze and design op amp circuits used in instrumentation applications, and how to analyze and test digital logic circuits for simple applications. Students will be able to model and mathematically describe circuit behavior under either static or dynamic conditions. To facilitate learning, this course makes use of a circuit simulator and has a laboratory component (with a design project) to reinforce course material and develop laboratory skills with electronic instruments.

### LEARNING OUTCOMES:

	<i>Objectives/Outcomes upon successful completion of the course</i>	<i>Assessment Techniques</i>
1.	Analyze circuits containing resistors, op amps, and DC sources using Ohms law, Kirchhoff's laws, and several network theorems.	Exams, HW
2.	Perform transient analysis of linear first order circuits containing DC sources, resistors, capacitors, and/or inductors.	Exams, HW
3.	Perform simple design using available components.	Project
4.	Analyze circuits in AC steady-state with sinusoidal sources, resistors, capacitors, and inductors.	Exams, HW
5.	Use electrical test equipment to analyze simple circuits	Exams, HW

**TEXTBOOK:** Irwin and Nelms, Basic Engineering Circuit Analysis, 11th Edition, Wiley.



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dition.

### REQUIRED RESERVED READING:

NONE

### RECOMMENDED RESERVED READING:

NONE

### GRADING POLICY

#### -ASSESSMENT METHODS:

Assignment	Guidelines	Weight
Homework	Homework assignments will be graded: the average grade weighs 10 percent of the final grade.	15%
Project		5%
Lab		20%
Intermediate exams	There will be four intermediate exams, one on each week.	30%
Final exam		30%

The overall course grades will be assigned as follows:

93 - 100:	A
90 - 92:	A-
87 - 89:	B+
83 - 86:	B
80 - 82:	B-
77 - 79:	C+
73 - 76:	C
70 - 72:	C-
67 - 69:	D+
63 - 66:	D
60 - 62:	D-
Under 60:	F

#### -ASSESSMENT CRITERIA:

**A** Superior work directly addresses the question or problem raised; provides a coherent argument displaying an extensive knowledge of relevant information; demonstrates the ability to critically evaluate concepts and theory; and has an element of originality. There is clear evidence of a significant amount of reading.

**B** Good work is highly competent; directly addresses the question or problem raised; demonstrates some ability to critically evaluate theory and concepts and relate them



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to practice; and discussions reflect the student's own arguments and are not simply a repetition of standard lecture and reference material. The work provides evidence of reading beyond the required assignments.

**C** Satisfactory work provides answers that are clear but limited, reflecting the information offered in the lectures and reference readings only; it may have some significant structural flaw, absence of information or research background, or too casual and imprecise a treatment, or contain only a minimum of interpretation.

**D** Poor work lacks a coherent grasp of the material; fails to support its argument with sufficient evidence; indicates a hasty or unconsidered preparation, and/or fails to fulfil the assignment in some way; omits important information and includes irrelevant points.

**F** Failure work fails to show any knowledge or understanding of the issues raised in the question; most of the material in the answer is irrelevant.

### ATTENDANCE REQUIREMENTS:

Students are expected to participate in all scheduled classes. Absences and late arrival will be noted, and may affect your grade.

Students are expected to have dealt with food, drink and bathroom needs before class. Make-up work is not offered, except in exceptional circumstances and after consultation with the Dean's Office.

*Please refer to the university catalog for the attendance and absence policy.*

SCHEDULE				
Session	Lecture Focus	Lab Topic	Reading Assignment / Other Assignment	Meeting Place/Exam Dates
Week 1	Introduction; Review of Physics; Circuit elements; Kirchhoff's laws; Ohm's law Series/parallel resistors; voltage/current division; nodal analysis of circuits	Simulation, DC Resistive Circuits	Ch. 1, 2, 3	Exam 1
Week 2	Nodal analysis of circuits (cont'd); op amp circuits; network theorems	Op Amps	Ch. 4, 5	Exam 2
Week 3	Network theorems (cont'); digital circuits; inductors and capacitors	Network Theorems	Ch. 6	Exam 3
Week 4	Transient analysis of circuits (1 <sup>st</sup> Order)	1 <sup>st</sup> Order Transients	Ch. 7	Exam 4
Week 5	AC steady state	AC Steady State	Ch. 9, 10	Final Exam (Friday)