



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

LAST REVIEW: 2009-2010
(i.e. 2003-2004)

NEXT REVIEW: 2014-2015
(i.e. 2008-2009)

STATUS: A
(A, I, D)

COURSE TITLE: A C Circuits

COMMON COURSE NUMBER: EET 1025C

CREDIT HOURS: 5

CONTACT HOUR BREAKDOWN
(per 16 week term)

CLOCK HOURS:
(Voc. Course ONLY)

Lecture: **64** Lab: **32**

Clinic: Other:

PREREQUISITE(S): EET 1015C, MTB 1325

COREQUISITE(S): None

PRE/COREQUISITE(S):

COURSE DESCRIPTION: Upon completion of this course, the student shall demonstrate a knowledge of circuit analysis using alternating voltage sources, including the behavior of resistive and reactive passive circuit elements, and frequency and transient response. Magnetic circuits, resonance and ideal transformers are also included. Extensive laboratory experience is included. Student fee charged.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area
General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

UNIT TITLES

- 1. Electromagnetism**
- 2. AC Voltages and Currents**
- 3. Phasors and Complex Numbers**
- 4. Capacitors**
- 5. Inductors**
- 6. Transformers**
- 7. RC Circuits**
- 8. RL Circuits**
- 9. RLC Circuits and Resonance**



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EVALUATION:

Students will be assessed through a variety of means. Evaluation may include, but is not limited to, the following: exams, quizzes, presentations, portfolios, discussions, class participation, attendance, projects, networking diagnosis, co-ops, practical, internships, externships, and research reports.

Common Course Number: EET 1025C

UNITS

Unit 1: Electromagnetism

General Outcome:

- 1.0 The students shall: be able to demonstrate an understanding of magnetism, applications of electromagnetism and induced voltages.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 1.1 Describe the magnetic field.**
- 1.2 Describe electromagnetism.**
- 1.3 Describe common electromagnetic devices.**
- 1.4 Describe magnetic hysteresis.**
- 1.5 Describe electromagnetic induction.**
- 1.6 Demonstrate applications of electromagnetic induction.**



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Unit 2: AC Voltages and Currents

General Outcome:

- 2.0 The students shall: be able to demonstrate an understanding of the definitions and relationships of various types of AC wave forms, phase relations, and effective values and perform computations necessary in alternating current circuits.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 2.1 Analyze the various types of alternating voltages and currents, such as pulse waves, square waves, saw tooth waves, triangular waves, and sine waves.**
- 2.2 Define the meaning of period and the mathematical relationship between frequency and period.**
- 2.3 Solve problems involving relationships between the effective, peak, and peak-to-peak values of alternating current waveforms.**
- 2.4 Use an oscilloscope to measure amplitude, period and frequency of alternating waveforms.**



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Unit 3: Phasors and Complex Numbers

General Outcome:

- 3.0 The students shall: be able to perform operations using phasors and complex numbers.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 3.1 Use a phasor to represent a sine wave.**
- 3.2 Use complex numbers to express phasor quantities.**
- 3.3 Represent phasors in two complex forms.**
- 3.4 Do mathematical operations with complex numbers.**



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Unit 4: Capacitors

General Outcome:

- 4.0 The students shall: be able to explain the operation of capacitors in DC and AC circuits, solve and analyze capacitive circuits.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 4.1 Describe the basic structure and characteristics of a capacitor.
- 4.2 Discuss various types of capacitors.
- 4.3 Analyze series capacitors.
- 4.4 Analyze parallel capacitors.
- 4.5 Analyze capacitive DC circuits.
- 4.6 Analyze capacitive AC circuits.
- 4.7 Discuss some capacitor applications.



Common Course Number: EET 1025C

Unit 5: Inductors

General Outcome:

- 5.0 The students shall: be able to explain the operation of inductors in DC and AC circuits, solve and analyze inductive circuits**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 5.1 Describe the basic structure and characteristics of an inductor.**
- 5.2 Discuss various types of inductors.**
- 5.3 Analyze series inductors.**
- 5.4 Analyze parallel inductors.**
- 5.5 Analyze inductive DC switching circuits.**
- 5.6 Analyze inductive AC circuits.**
- 5.7 Discuss some inductor applications.**



Common Course Number: EET 1025C

Unit 6: Transformers

General Outcome:

- 6.0 The students shall: be able to demonstrate an understanding of the operation of transformers and their applications.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 6.1 Explain mutual inductance.**
- 6.2 Describe how a transformer is constructed and how it operates.**
- 6.3 Explain how a step-up transformer works.**
- 6.4 Explain how a step-down transformer works.**
- 6.5 Discuss the effect of a resistive load across the secondary winding.**
- 6.6 Discuss the concept of a reflected load in a transformer.**
- 6.7 Discuss impedance matching with transformers.**
- 6.8 Explain how the transformer acts as an isolation device.**
- 6.9 Describe a practical transformer.**
- 6.10 Describe several types of transformers.**



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Unit 7: RC Circuits

General Outcome:

7.0 The students shall be able to analyze and troubleshoot RC circuits.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

7.1 Describe the relationship between current and voltage in an RC circuit.

7.2 Determine impedance and phase angle in a series RC circuit.

7.3 Analyze a series RC circuit.

7.4 Determine impedance and phase angle in a parallel RC circuit.

7.5 Analyze a parallel RC circuit.

7.6 Analyze series-parallel RC circuits.

7.7 Determine power in RC circuits.

7.8 Discuss some basic RC applications.

7.9 Troubleshoot RC circuits.



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Unit 8: RL Circuits

General Outcome:

8.0 The students shall: be able to analyze and troubleshoot RL circuits.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 8.1 Describe the relationship between current and voltage in an RL circuit.**
- 8.2 Determine impedance and phase angle in a series RL circuit.**
- 8.3 Analyze a series RL circuit.**
- 8.4 Determine impedance and phase angle in a parallel RL circuit.**
- 8.5 Analyze a parallel RL circuit.**
- 8.6 Analyze series-parallel RL circuit.**
- 8.7 Determine power in RL circuits.**
- 8.8 Discuss some basic RL applications.**
- 8.9 Troubleshoot RL circuits.**



Common Course Number: EET 1025C

Unit 9: RLC Circuits and Resonance

General Outcome:

- 9.0 The students shall: be able to analyze and troubleshoot RLC circuits and resonant circuits.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 9.1 Determine the impedance of a series RLC circuit.**
- 9.2 Analyze series RLC circuits.**
- 9.3 Analyze a circuit for resonance.**
- 9.4 Determine the impedance of a parallel resonant circuit.**
- 9.5 Analyze parallel and series-parallel RLC circuits.**
- 9.6 Analyze a circuit for parallel resonance.**
- 9.7 Determine the bandwidth of resonant circuits.**
- 9.8 Discuss some system applications of resonant circuits.**