

STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

ELEC 102 – ELECTRIC CIRCUITS (II)

Prepared By: Stephen E. Frempong

SCHOOL OF ENGINEERING TECHNOLOGY
ELECTRICAL ENGINEERING TECHNOLOGY &
ENGINEERING SCIENCE DEPARTMENT
SPRING 2018

- A. TITLE: ELECTRIC CIRCUITS (II)
- B. COURSE NUMBER: ELEC 102
- C. CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 3 !
 # Lecture Hours: 3 per week !
 # Lab Hours: per week !
 Other: per week

Course Length: 15 Weeks

D. WRITING INTENSIVE COURSE: NO

E. GER CATEGORY: NONE

F. SEMESTER(S) OFFERED: SPRING

G. COURSE DESCRIPTION: A continuation of Electric Circuits (I), stressing the understanding of AC analysis that involve resistive, capacitive, and inductive circuits. Also, impedance, resonance, filters and transformers are covered. Students will analyze circuits of various configurations and enhance computational skills. Three hours lecture per week.

H. PRE-REQUISITES: Electric Circuits (I) ELEC 101/109, and Math 123, or permission of instructor.

CO-REQUISITES: NONE

I. STUDENT LEARNING OUTCOMES

Institutional Student Learning Outcomes (ISLO)

- (1) ! Communication (2) Critical Thinking (3) Foundational Skills
 (4) Social Responsibility (5) Industry, Professional, Discipline-Specific Knowledge and Skills

ABET-STUDENT OUTCOMES (a-k)

Course Objectives	Institutional SLO's	ABET Student Outcomes
Become familiar with the characteristics of sinusoidal waveform and perform calculations	2. Critical Thinking 3. Foundational Skills 5. Industry, Professional, Discipline-Specific Knowledge and Skills.	(b) An ability to select and apply a knowledge of mathematics, science,

		<p>engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.</p> <p>(k) A commitment to quality, timeliness, and continuous improvement.</p>
<p>Become familiar with the response of a resistor, inductor, and capacitor to the application of a sinusoidal voltage or current.</p>	<p>2. Critical Thinking 3. Foundational Skills 5. Industry, Professional, Discipline-Specific Knowledge and Skills.</p>	<p>(b) An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.</p> <p>(k) A commitment to quality, timeliness, and continuous improvement.</p>
<p>Develop confidence in the analysis of series-parallel ac networks.</p>	<p>5. Industry, Professional, Discipline-Specific Knowledge and Skills.</p>	<p>(b) An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems</p>

		that require the application of principles and applied procedures or methodologies.
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J. ! APPLIED LEARNING COMPONENT: CLASSROOM

K. TEXTS: Introductory Circuit Analysis 13/e
 By – Boylestad ISBN: 9780133923605
 Publisher: Prentice Hall

L. ! REFERENCES: Electric Circuits Fundamentals
 By – Floyd ISBN: 0130163945
 Publisher: Prentice Hall

M. EQUIPMENT: No equipment needed for lecture part of the course with the exception of scientific calculator. If computer is needed, student computer lab is available.

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS: Tests, Homework, Quizzes and Final Exams.

P. DETAILED COURSE OUTLINE:

1. The Basic Elements and Phasors

- Derivative
- Response of R, L, and C Elements to a Sinusoidal Voltage or Current
- Frequency Response of the Basic Elements
- Average Power and Power Factor
- Complex Numbers
- Rectangular Form
- Polar Form
- Conversion between Forms

2. Series and Parallel in ac Circuits

- Impedance and Phasor Diagram
- Series Configuration
- Voltage Divider Rule
- Frequency Response for Series ac Circuits

- Admittance and Susceptance
- Parallel ac Networks
- Current Divider Rule/Frequency Response

3. Series-Parallel ac Networks

4. Resonance

- Series Resonant Circuit
- The Quality Factor (Q)
- Z_t versus Frequency
- Selectivity
- V_L , V_L , and V_C
- Parallel Resonant Circuit
- Selectivity Curve for Parallel Resonant Circuits

5. Decibels, Filters

- Properties of Logarithms
- Decibel
- Filters
- R-C Low-Pass Filter
- R-C High-Pass Filter
- Pass-Band Filters
- Stop-Band Filters
- Double-Tuned Filter
- Low-Pass Filter
- High-Pass Filter
- Crossover Networks

6. Transformers

- Mutual Inductance
- The Iron-Core Transformer
- Reflected Impedance and Power
- Impedance Matching, Isolation, and Displacement
- Equivalent Circuit (Iron-Core Transformer)
- Frequency Considerations
- Series Connection of Mutually Coupled Coils
- Air-Core Transformer
- Types of Transformers
- Tapped and Multiple-Load Transformers
- Network with Magnetically Coupled Coils

Q. LABORATORY OUTLINE: NONE !