LaGuardia Community College
The City University of New York
Mathematics, Engineering, and Computer Science
Fall I, 2020

MAE 111: Circuit Analysis II
4 credits (2 Lecture hours, 2 Lab hours)

COURSE DESCRIPTION:
This course introduces students to analysis of AC circuits with sine-wave sources and R L C circuit components, covering phase shift, frequency response, power, and resonance in series and parallel circuits. Three-phase wye and delta circuits are also covered. Hands-on laboratory experiments are included.

TEXTBOOK:
1. Introductory Circuit Analysis (13th Edition) 13th Edition, by Robert L. Boylestad (Author), Pearson Education , ISBN-13: 978-0133923605

Lab Manual: Laboratory Manual for Introductory Circuit Analysis
13th Edition **by Robert L. Boylestad (Author),** Gabriel
Kousourou (Author), Pearson Education
ISBN-13: 978-0133923780
ISBN-10: 0133923789

Optional: **Charles K. Alexander and Matthew N.O. Sadiku: "Fundamentals Electric Circuits", 6th Edition, McGraw Hill, 2015**

GRADING POLICY:	HW	10%
	10 Labs	30%
	3 Tests	30%
	Final exam	30%

Weekly Topics

1 Sinusoidal alternating waveform generation, frequency, period, phase instantaneous, peak, peak-to- peak average, effective values, AC meter

Lab 1: Introduction to electrical circuit elements

2 Responses of R, L and C elements to AC input, capacitive and inductive reactance

Lab 2: Basic RL and RC circuits

3 Average power and power factor, complex numbers
Lab 3: Phasor vector review

4 Phasors-polar and rectangular formats, P to RX conversion, R to P conversion

Lab 4: The oscilloscope
Test #1

5 Series AC circuit analysis using phasors (R-L, R-C, and R-L-C), Ohm's law, Kirchhoff's voltage law, voltage divider rule, frequency response

Lab 5: Capacitive and inductive reactance

6 Parallel AC circuit analysis using phasors (R-L, RC, R-L-C), Kirchhoff's current law, current divider rule, admittance and susceptance, frequency response, equivalent circuits, dual trace, oscilloscope phase measurements

Lab 6: Series RLC circuits

7 Series-parallel circuits, reduction of series-parallel circuits to series circuits, analysis of ladder circuits

Lab 7: Parallel RLC circuits
Test #2

8-9 Selected network theorems for AC circuits, source conversion, mesh analysis, nodal analysis

Lab 8: Series-parallel RLC circuits

10-11 Thevenin's theorem, Super-Position theorem maximum power transfer theorem

Lab 9: AC Super-Position and Thevenin's theorem

12 Power-true, reactive and apparent power, power factor correction, wattmeter, effective resistance, series resonance including Q factor selectivity
Test #3

Lab 10: AC maximum power transfer

13 Final Exam

Course Coordinator

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