Texas A&M University – Corpus Christi
College of Science and Technology
Engineering Technology

Course number and title: ENTC 2414 Circuit Analysis I

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisite: PHYS 2426

Course description:
Includes fundamentals of electrical potential, current, and electrical power in DC circuits; laws and relationships applied to the analysis of circuits; resistance, capacitance, and inductance.

Textbooks
Introductory Circuit Analysis, 10th Edition, Robert Boylestad, 2003, Prentice Hall

Experiments in Circuit Analysis, 10th Edition, Robert Boylestad and G. Kousourou, 2003, Prentice Hall

Course Objectives
This course is designed to enable students to:

- Develop an understanding of the physical properties and mathematical concepts that govern resistors, capacitors, and inductors.
- Have an understanding of network theorems that are used to analyze electrical circuits.
- Develop a basic understanding of the different ways electrical energy is generated.
- Comprehend the principles governing magnetism and magnetic devices.
- Become familiar with physical components, schematic symbols, resistor color code, electrical units, and relationships of electrical quantities.
- Gain instrument measurement skills using series, parallel, and series-parallel circuits.

Assessment

	Points		**If**	**Grade**
Quizes	5		90 ≤ Total < XX	A
Midterm 1	20		80 ≤ Total < 90	B
Midterm 2	20		70 ≤ Total < 80	C
Lab Exercises	20		60 ≤ total < 70	D
Homework	10		xx < Total < 60	F
Final	25			
Total	100			

Topics covered:
Units of measurement, systems of units, symbols, conversion tables, current, voltage, fixed supplies, conductors and insulators, semiconductors, ammeters and voltmeters, resistance, color coding, conductors, ohmmeters, Ohm's law, power, wattmeters, efficiency, energy, series circuits, Kirchhoff's voltage law, voltage divider rule, voltage regulation, measurement techniques, parallel networks, Kirchhoff's current law, current divider rule, open and short circuits, series-parallel networks, ladder networks, grounding, current sources, source conversions, branch-current analysis, mesh analysis, nodal analysis, wye-delta and delta-wye conversions, superposition, Thevenin's and Norton's theorems, maximum power transfer, capacitance, types of capacitors, energy storage by a capacitor, capacitors in series and parallel, magnetic fields, flux density, permeability, reluctance, magnetic circuits, magnetic flux, inductance, types of inductors, Faraday's law, induced voltage, energy storage by an inductor, inductors in series and parallel.

Laboratory Exercises/Experiments:
Lab 1 Lab instruments
Lab 2 Current and voltage
Lab 3 Resistance, color coding
Lab 4 Ohm's law, power & energy
Lab 5 Series circuits
Lab 6 Parallel circuits
Lab 7 Series-parallel circuits
Lab 8 Methods of analysis
Lab 9 Networks theorems
Lab 10 Networks theorems
Lab 11 Capacitors
Lab 12 Capacitors
Lab 13 Magnetic circuits
Lab 14 Inductors

Prepared by: Hesham Shaalan **Date**: _____