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

ENTC 2414 Circuit Analysis I
Spring 2007

COURSE INFORMATION

Prerequisite: MATH 2413 Calculus I
Meeting Time: TR 5:30-6:45 p.m. (Lecture), TR 7:00-8:15 p.m. (Laboratory)
Meeting Place: ST 116 (Lecture), ST 221 (Laboratory)

PROFESSOR INFORMATION

Dr. Ruby Mehrubeoglu (Dr. M.)
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Office Phone: (361) 825-3378, FAX Number: (361) 825-5848
Office Hours: TR 2:00 pm – 5:00 pm, and by appointment
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TEXTBOOKS

1. Robert Boylestad, *Introductory Circuit Analysis*, 11th Ed., Upper Saddle River: Prentice Hall, 2007.
2. Robert Boylestad and Gabriel Kousourou, *Experiments in Circuit Analysis*, 10th Ed., Prentice Hall, 2003

COURSE DESCRIPTION

This course covers the fundamental aspects of DC circuit analysis: charge, voltage, resistance, current, and power; Ohm's Law; methods of analysis; series and parallel circuits; Kirchhoff's voltage and current laws; mesh and nodal analyses; superposition, Thevenin and Norton Theorems; ideal and real electric sources; RC and LC circuits; transient analysis; electrical measurement instruments. The laboratory provides hands-on experience with various electrical instruments and devices. A software program, Electronics Workbench, is used for circuit analysis and simulation.

STUDENT LEARNING OUTCOMES

At successful completion of this course the student will be able to:

- Develop an understanding of the physical properties and mathematical concepts that govern resistors, capacitors, and inductors
- Develop a basic understanding for 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 relationship of electrical quantities
- Gain instrument measurement skills using series, parallel, and series-parallel circuits
- Use Kirchhoff's Laws for DC circuit analysis
- Convert between voltage and current sources
- Use loop and node analysis techniques to analyze series-parallel networks
- Make power computations
- Understand and Apply network theorems such as superposition, Thevenin's and Norton's to DC electrical circuits
- Design practical voltage dividers
- Use basic electrical instruments such as ammeters, voltmeters, and power supplies
- Build and test a DC circuit with variable load resistance to verify Thevenin's theorem
- Perform transient analysis in RC and RL circuits
- Keep a proper record of experimental work in laboratory notebook

INSTRUCTIONAL METHODS

Methods and activities for instruction include the following: lectures, group discussion, group work, homework assignments, lab experiments, software simulations, and examinations.

GRADING

In addition to the homework assignments, there will be unannounced quizzes, two midterms, lab experiments, a final exam, and a student laboratory notebook which will be turned in before the final exam. The format and contents of the notebook will be explained in class. You may examine the final exam within four weeks after the final grades are mailed to you. The final grade is computed as follows.

	Percent of Final Grade		If your score is:	Your grade is:
UnannouncedQuizzes	5		90 or greater	A
Midterm 1	15		80 To 89	B
Midterm 2	20		70 To 79	C
Lab Exercises/Reports	20		60 To 69	D
Homework	10		Less Than 60	F
Notebook	5			
Final	25			
Total	**100**			

MAKEUP EXAMINATIONS:

No makeup examinations will be given except in the case of a documented extreme emergency. Makeup exams will be different from the regular exams and hence may be more difficult. There will be no makeup for unannounced quizzes.

SUPPORT SERVICES FOR STUDENTS WITH DISABILITY

Refer to the University Catalog.

ATTENDANCE POLICY

You are advised to attend all lectures and laboratory sessions. If you miss a class, you are responsible for whatever was covered or announced during your absence. You should be aware that unexcused absences will result in points being deducted from your final grade. Each unexcused absence after the first three will decrease your final grade by one point. Potentially you could pass every test and still fail the course due to unexcused absences.

ACADEMIC HONESTY

Your attention is called to the University policy in the Student Handbook.

ASSIGNMENTS

Late assignments are not normally accepted. Assignments, however, may be turned in before the due date (they may be left in my mailbox, sent with a classmate, mailed, etc.).

LAB EXPERIMENTS

The goal of the laboratory sessions is to analyze and verify the theoretical ideas learned in the classroom. All experiments must be performed during the scheduled time (the lab is closed at all other times). All theoretical analysis and data calculations must be done before the lab, and documented in the lab notebook, as this makes performing the experiments much smoother.

LAB REPORTS

Students must submit a written report a week after each experiment is performed. Late reports are not normally accepted. Reports, however, may be turned in before the due date (they may be left in my mailbox, sent with a classmate, mailed, faxed, etc.). Guidelines for the lab reports will be distributed during the second week of the semester.

SUPPLEMENTARY READING LIST

Circuit Analysis: Theory and Practice, 4th Ed., Robbins and Miller, 2007
Circuits, Bruce Carlson, Brooks/Cole, 2000
Electric Concepts and Applications, Boctor, West Publishing Co., 1997
Basic Engineering Circuit Analysis, 6th Ed., Irwin and Wu, Wiley, 1999
Linear Circuit Analysis, Davis, PWS, 1998

TENTATIVE WEEKLY SCHEDULE

WK	Week of	Readings	Topics	Experiment, #	Exams
1	01/08	Ch. 1	Introduction, Units of Measurement, Conversion of Units	Lab Safety, Intro to Lab Instruments Electronic Workbench 1	
2	01/15	Ch. 2	Voltage and Current	2	
3	01/22	Ch. 3	Resistance, Resistors, Color Coding	3	
4	01/29	Ch. 4	Ohm's Law, Power, Energy	4, Electronic Workbench 2	
5	02/05	Ch. 5	Series DC Circuits	6	
6	02/12	Ch. 6	Parallel DC Circuits	7, Electronic Workbench 3	**MID 1**
7	02/19	Ch. 6, 7	Parallel DC Circuits	8	
8	02/26	Ch. 7, 8	Series-Parallel Circuits	9, Electronic Workbench 4	
9	03/05	Ch. 8	Methods of DC Analysis	No Labs	
10	03/12	**S P R I N G B R E A K**			
11	03/19	Ch. 9	Network Theorems: Superposition, Thevenin's, Norton's	10, Electronic Workbench 5	
12	03/26	Ch. 9	Network Theorems: Max Power Transfer, Millman's, Substitution, Reciprocity	11, Electronic Workbench 6	**MID 2**
13	04/02	Ch. 10	Capacitors	12	
14	04/09	Ch. 10	Capacitors	13, Electronic Workbench 7	
15	04/16	Ch. 11	Inductors	14	
16	04/23	Ch. 12	Magnetic Circuits		
17	04/30		Review	Review	
	Final Examination Date: Thursday, 3 May 2007, 4:30-7:00 pm				

Please note that the actual dates for the lectures on specific material may vary from the above schedule. The timing of the major exams is intended to follow the presentation of the material indicated; therefore, the actual dates of the exams may vary. In addition, the specific labs assigned may vary.