NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York

DEPARTMENT: Electrical and Telecommunications Engineering Technology

SUBJECT CODE AND TITLE: EET1122/ET162 Circuits Analysis I

COURSE DESCRIPTION: Introduction to dc circuits. Topics include series, parallel, and series parallel circuits, network theorems, equivalent circuits, capacitive and inductive circuits, timing circuits and measuring instruments. Laboratory experiments include breadboarding, measurement techniques and troubleshooting. The writing of laboratory reports is taught and written reports are required.

PRE -COREQUISITES: EET1102/ET100, MAT 1275/MA 275, PHYS 1433/SC 433 or equivalent

TEXTBOOK: Introductory Circuit Analysis, 11th Edition
R. Boylestead, Prentice Hall

NEEDED EQUIPMENT: Students **must** have a **calculator** capable of performing complex arithmetic – such as the Casio Fx300V
Students **must** also have a **Digital Multimeter** (DMM) for use in the Laboratory

COURSE OBJECTIVES/ COURSE OUTCOMES: Upon completion of this course, students will be able to:
1. Use Ohm's Law and Kirchhoff's voltage and current laws to analyze networks (ABET Criteria 2a, 2b, 2c, 2d, 2e, 2f, 2k).
2. Analyze circuits with multiple sources using the superposition theorem (ABET Criteria 2a, 2b, 2c, 2d, 2e, 2f, 2k).
3. Analyze and solve circuit problems using different methods such as Mesh analysis, Nodal analysis Thenenin's and Norton's equivalent circuits (ABET Criteria 2a, 2b, 2c, 2d, 2e, 2f, 2k).
4. Analyze series and parallel circuits with capacitors and with inductors (ABET Criteria 2a, 2b, 2c, 2d, 2e, 2f, 2k).
5. Analyze transients in RC and RL circuits with initial conditions (ABET Criteria 2a, 2b, 2c, 2d, 2e, 2f, 2k).

TOPICS: Topics include an analysis, Breadboarding and testing of series, parallel and series-parallel circuits.

CLASS HOURS: 3

LAB HOURS: 3

CREDITS: 4

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EXPERIMENT: EET 1122/ET162

- Introduction to laboratory. Department rules, procedure, policies. Proper way to write a laboratory report.
- Lecture on nature of voltage, current and resistance. Simple Ohm's Law examples.
- Explain use of meters and the Feedback Kit Experiment

1. Experiment 1-Color Code.
2. Experiment 2-Ohm's Law.
3. Experiment 3-Series Circuits.
4. Experiment 4-Parallel Circuits.
5. Experiment 5-Series-parallel Circuits 1
6. Experiment 6-Series-parallel Circuits 11
7. Experiment 7-Troubleshooting (resistance measurements)
8. Experiment 7-Troubleshooting (voltage measurements)
9. Experiment 8-Meter Sensitivity & Accuracy
10. Experiment 9-Superposition
11. Experiment 10-Thevenin's Theorem

GRADING POLICY: EET 1122/ET 162

Homework and class participation	10%
Class Midterm Exam	40%
Lab Participation & Lab Reports	20%
Final Examination	30%

Letter Grade	Numerical Grade Ranges	Quality
A	93-100	4.0
A-	90-92.9	3.7
B+	87-89.9	3.3
B	83-86.9	3.0
B-	80.82.9	2.7
C+	77-79.9	2.3
C	70-76.9	2.0
D	60-69.9	1.0
F	59.9 and below	0.0

WEEK	TOPIC	READING ASSIGNMENT	HOMEWORK PROBLEMS
1	Introduction to the course. Units of measurement. Scientific notation. Operation of a scientific calculator, significant figures, and rounding off.	Chapter 1 Pages 1-25	1-12, 1-14, 1-24, 1-26 1-41, 1-42, 1-43
2-3	Explain the nature of current, voltage and resistance. Basic electrical symbols Ohm's Law. Types of resistors color coding of resistors. Power calculations Power ratings and safety factors as applied to resistors.	Chapter 2 : Pages 33,41,51-54 Chapter 3 : Pages 63-88 Chapter 4 : Pages 101-110	3-9, 3-18, 3-24, 3-34, 3-40, 3-41, 3-46, 3-47, 3-53 4-2, 4-4, 4-6, 4-8, 4-20, 4-24, 4-25, 4-26,4-49,4-52
3- 4	Series Circuits Kirchoff's Voltage Law. Inter- changing series elements. Ideal dc voltage sources vs. non-ideal sources. Voltage division, single and double subscript notation.	Chapter 5 Pages 131-162	5-1, 5-2, 5-4, 5,7, 5-10, 5-11, 5-15, 5-16, 5-22,5-23,5-24, 5-26,5-30,5-41,5-43
5-6	Parallel Circuits Kirchoff's Current Law. Equivalent Resistance calculations. Current divider rule. Voltage sources in parallel. Power calculations	Chapter 6 Pages 185-221	6-1, 6-4, 6-7, 6-10, 6-18, 6-20, 6-23, 6-28, 6-29
7	Series-Parallel Networks. Block diagram approach. Reduction of series parallel circuits to a series circuit. Ladder network analysis. Power calculations. Wheat-stone Bridge. Computer analysis of problems.	Chapter 7 Pages 248-259	7-2, 7-4, 7-7, 7-11, 7-15, 7-25, 7-26 In addition, the instructor will select problems from the above set or other problems in chapter 7 to be solved by using EWB software.
8	Opens & Shorts, Multiple Sources Superposition Theorem.	Chapter 8: Pages 284-292, 295-310, 313-321	8-2,8-4,8-6,8-7,8-8,8-19,8-22,8-23,8-25,8-31
9	**Midterm Exam**		
10	Methods of analysis , Source conversion Mesh Analysis, Nodal Analysis Thevenin's Theorem, Norton's Theorem	Chapter 9 Pages 345-367	9-2, 9-4, 9-6, 9-13, 9-14, In addition, the instructor will select problems from the above set or other problems in chapter 8 to be also solved by EWB software.
11-12	Capacitance Physical factors determine capacitance. Types of capacitors. Analysis of capacitors in series and parallel circuits.	Chapter 10 397-415 418-442	10.3-10.4, 10.14, 10-51,10-52, 10-54, 10-57
12-13	RC time constant. Capacitor charge and discharge phenomena using equations and a calculator to analyze and graph. RC circuit responses using initial.	Chapter 10 Pages 415-437	10.22,10.24,10.27, 10.28
13-14	Magnetism and inductance Concept of magnetic forces and fields. Basic magnetic properties including flux, flux density, permeability, magnetizing force, and BH curves Faraday's Law Lenz's Law, Physical factors determine inductance Ideal vs. non-ideal inductors RL time constant current buildup and discharge in RL circuits. Comparing solutions to RC circuits.	Chapter 11 461-487 Chapter 12 Pages 513-537	11.2,11.4,11.8,11.10,1.12,11.14,11-22, 12.2,12.4,12.6 12.12-12.14
15	**Final Exam**		