

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

DEPARTMENT: Electrical and Telecommunication Engineering Technology

SUBJECT CODE EET1102/ET 100

AND TITLE: Techniques of Electrical Technology

COURSE DESCRIPTION: An introduction to the use of computers for analysis of electrical and electronic circuits by using state-of-the-art software computer simulation of circuits.

PRE or COREQUISITE: MAT1175/MA 175

TEXTBOOK: 1) Text book: Introduction to MATLAB 7 for Engineers by William J. Palm III
McGraw-Hill Higher Education, 2005. ISBN 0-07-2548183-5
2) Multisim (capture& schematics) hand out downloaded at:
<http://www.interactiv.com/pdf/MS7GS.pdf>

COURSE OBJECTIVES: Upon completion of this course, students will be able to:

- 1) Describe the basic operations of a Personal Computer, the use of some software applications such as MS words, MS equation 3, EXCEL, to solve and plot engineering problems.(ABET Criteria 2a, 2g, 2k)
- 2) Define good problem solving techniques and program design and be able to apply these to solving engineering problems using MATLAB.(ABET Criteria 2a, 2b, 2f, 2k)
- 3) Demonstrate the ability to solve fundamental DC circuits using a Multisim basics and to capture, simulate, and analyze electrical schematics.(ABET Criteria 2a, 2b, 2f, 2k)

TOPICS:

1. Basic **computer** operations; software licensing requirements and Number systems, bits, bytes. ASCII code ,scientific notation, metric prefixes.
2. **Application software** :MS words; Text, Inserting & drawing tables, graph ,MS Equation3&Excel basic; getting around in worksheet, entering data, formulas, excel graphing, importing/exporting data.
3. **MATLAB:** Problem solving Basic input/output variables: types, scalars, arrays, strings Assignment operator and expressions Script files.
4. MATLAB Arrays, Matrices & polynomial operations with arrays
5. MATLAB files, functions
6. MATLAB programming using logical operations ,for and while loops,
7. MATLAB plotting, functions & data
8. Solving linear algebraic equations in MATLAB
9. **Multisim (capture& schematics)** Basics: Drawing a Schematic dc circuit ; Creating and Editing a Component
10. Adding Instruments to the circuit
11. Simulating circuit & performing analyses

CLASS HOURS: 1

LAB HOURS: 2

CREDITS 2

Prepared by: Professor. M. Makdisi, November 2006

Course Coordinator: Professor X.Wei, email: Xwei@citytech.cuny.edu

LABORATORY COURSEWORK:

Week	Descriptive details for laboratory coursework:
1	Introducing students to computer lab& rules and homework& projects format
2	Computer on ,off, logging to a network, opening ms words: typing formatted text, inserting tables and Ms Equation3 graphs, saving (on floppy & Flash drive), printing
3	Excel : entering data($V=IR$ experimental table results), formulas($V=IR$ theoretical result), Use excel to plot data& formula,
4	MATLAB Interactive session: starting MATLAB, entering command, making calculations by translating the Mathematic expression into the MATLAB statements. Practice T1.1-1 on p(11).
5	Practice on tables 1.1 p(13)&P(15).and practice T1 p(16)Complex numbers.
6	Practice on table 2.1 P(77) & table 2.3 P(85).Do Current power Dissipation in resistors P(93) Polynomial practice T2.5(1-5)P(111&112)
7	Practice table 3.1 p(142) & table 3.1 P9146). Do one example on a MATLAB user defined function
8	Drawing &using flow chart & Pesudocode MATLAB programming using logical operations ,for and while loops, Do examples 2 &3 on P(189) and also on P(211)&P9221)&p(43-51)
9	MATLAB plotting, functions &data Practice on table 5.1 P(269)&table 5.2 p(273). Graphical solution of equations Practice P(276-278).
10	Practice on Electrical Resistance Network on P(370&371).
11	MULTISIMS basic circuit components and operation(Grounded supply switch and a lamp in series) ,circuit construction (series, parallel, or series parallel circuits),
12	Adding Instruments to the circuit. ohms law, series and parallel measure voltage and current in a circuit.
13	simulation for the electrical resistance network on Page 370 add instruments to measure the currents
14	Project: Typing a text and inserting tables ,Ms equation , graphing data & formulas using excel. And Multisims simulation for the electrical resistance network on Page 370 add instruments to measure the currents and use MATLAB to solve for the currents & compare the two results .
15	Final Exam

GRADING POLICY:

Class Participation	10%
Quiz	10%
Midterm Exam	30%
Final exam	30%
Homework & Project Reports	20%

Letter Grade	Numerical Grade Ranges	Quality Points
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

Weekly Schedule

WEEK	TOPICS	HOMEWORK
1	Basic computer operations, software licensing requirements and Number systems, bits, bytes. ASCII code Scientific notation, metric prefixes	Read introduction to a personal computer ,buy USB flash drive, or floppy
2&3	Application software :MS words; Text, Inserting & drawing tables, graph ,MS Equation3.Excel basic; getting around in worksheet, entering data, formulas, excel graphing, importing/exporting data.	Type Question 15 (Page 63) using MS Equation3. Use excel to graph the data(V=IR experimental table results)& formulas(V=IR) theoretical result),
4	MATLAB: Introduction to the class. Problem solving Basic input/output Variables: types, scalars, arrays, strings Assignment operator and expressions Script files	Type the Mathematic Expression of Section 1.1: #1-#6(P61-62).Solve the problems of Section1.3: 15(P63)) in MATLAB.
	Quiz	
5	MATLAB Arrays, Matrices polynomial operations with arrays	Solve Problems on the Section2.1: 7(P125) Solve the Problem 10, 11, 12, and 13 (Page 126 - 127)Solve the Problem 27, 28 (Page 132)
6	MATLAB files, functions	Solve Problem 39,40,41(P136) Solve Problems on Section3.1:1,2,&3(P177 Problem 6 (P178)
7	MATLAB programming using logical operations ,for and while loops,	3(p241),38,39,40 (p 67) Section 4.2: 4, 5, 6 (P241-P242)
8	Midterm Exam	
9	MATLAB plotting, functions & data	Read P259-P280. Problem Solving: Section 15(Page 343), 22 (P345),26(P 346)
10	Solving linear algebraic equations in MATLAB	Do problems 8,9, pages 404-405
11	Multisim (capture& schematics) Basics: Drawing a Schematic dc circuit ; Creating and Editing a Component	Download the electronic version of the "MultiSIM 7 http://www.interactiv.com/pdf/MS7GS.pdf
12	Adding Instruments to the circuit	Read the Chapter 1&2 of "MultiSIM 7 Getting Started and Tutorial."
13	Simulating circuit & performing analyses.	Read the Chapter 3&4 of "MultiSIM 7 Getting Started and Tutorial."
14	Project	Selected projects by the instructor. See lab course work
15	Final exam	