Academic Course Description

SRM University
Faculty of Engineering and Technology
Department of Electronics and Communication Engineering

EC1004 Electric Circuits Laboratory

Second Semester, 2013-14 (Even semester)

Course (catalog) description

To provide hand-on experience in designing and implementing basic AC and DC circuits. The laboratory exercises are designed to give students ability to design, build, and implement basic AC and DC circuits. This is a course to expose basic circuit concepts, circuit modeling and methods of circuit analysis in time domain and frequency domain for solving simple and multi dimensional circuits including coupled circuits and three phase circuits

Compulsory/Elective course: Compulsory for ECE students

Credit hours: 1 credits

Laboratory

Electron Devices Lab, TP9L2 & Basic Electronics Lab, TP10L2, Tech Park.

Course coordinator(s)

Mr. K.Kalimuthu, Assistant Professor (Senior Grade), Department of ECE

Instructor(s)

Name of the instructor	Class handling		Office location	Office phone	Email (domain: @ktr.srmuniv.ac.in)
	Sec	Batch			
Mr.A.Joshua Jafferson	A	A	TP1206A	2075	Joshua.j
	G	B			
Mr.T.Saminathan	B	A	TP10S4	--	Saminathan.t
	F	B			
Mrs.C. R. Uma Kumari	C	A	TP1203A	2064	Umakumari.c
	H	B			
Mr.K.Kalimuthu	D	A	TP11S3	2060	Kalimuthu.k
	E	B			
Mrs.V.Sarada	E	A	TP12S5	2087	Sarada.v
	J	B			
Mr.B.Srinath	F	A	TP1106A	2063	Srinath.b

	A	B			
Mrs.E.Chitra	G	A	TP12S3	2087	Chitra.e
	B	B			
Mrs. T.Theresal	H	A	TP1103A	2062	Thersal.t
	C	B			
Mr.S.Manikandaswamy	I	A	TP12S9	--	Manikandaswamy.s
	D	B			
Mrs. M.K.Srilekha	J	A	TP1006A	2061	Srilekha.m
	I	B			

Relationship to other courses

Pre-requisites: Nil

Assumed knowledge:

Basic knowledge about current, voltage, power & circuit elements

Following courses:

EC0203 Electron Devices

Text book(s) and/or required materials: Lab manual; additional materials posted on SRM web.

References

1. A.Sudhakar & Shyanmugam S.Palli " *Circuits & Network Analysis & Synthesis*", 2nd Edition, Tata McGraw Hill, 1994
2. Joseph Edminster, "Electric Circuits" Schaum's Outline Series, McGrawHill 2nd Edition.
3. http://www.semiconductordevices.com,
4. http://www.semiconductor.com,
5. http://www.electronic-circuits-diagrams.com,
6. http://www.electroniccircuits.com,
7. David A Bell, "Laboratory Manual for Electric Circuits", 6th edition, PHI

Computer usage: Nil

Hardware Laboratory Usage

Each laboratory station is equipped with a set of DC Regulated power supply, Ammeter, Voltmeter and CRO. Students work in groups of three, but maintain individual laboratory notebooks and submit individual reports.

Class / Lab schedule: one 100 minutes lab session per week, for 14-15 weeks

Section	Schedule
A	D.O: 2 FN
B	D.O:3 FN
C	D.O: 4 FN

D	D.O: 5 FN
E	D.O: 1 FN
F	D.O: 4 AN
G	D.O: 5 AN
H	D.O: 1 AN
I	D.O: 2 AN
J	D.O: 3 AN

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area: Communication | Signal Processing | **Electronics** | VLSI | Embedded

Course objectives

The objectives of this course is to	Correlates to Program Objective
1. To understand the concept of circuit laws	**(2)**
2. To solve the electrical network using mesh and nodal analysis by applying network theorems	**(2)**
3. To understand the concept of resonance in series and parallel circuits.	**(3)**
4. To analyze the transient response of series and parallel A.C. circuits and to solve problems in time domain using Laplace Transform. **.**	**(3)**

Course Learning Outcome

This course provides the foundation education in Circuit Analysis. Through lecture, laboratory, and out-of-class assignments, students are provided learning experiences that enable them to:	Correlates to program outcome		
	H	**M**	**L**

1. To discuss the classification of circuit elements, circuits and also the basic laws	a		
2. Analyze the basic dc and ac circuits by applying the network theorems.	b	c	a
3. Analyze the ac and dc transient circuits and also the coupled circuits.	b	c	a

H: high correlation, M: medium correlation, L: low correlation

Course Topics

No.	Lab Experiments	Sessions
1	Verification of Kirchoff's voltage and Current Laws	1
2	Verification of Superposition Theorem.	2
3	Verification of Thevenin's and Norton'sTheorem	3
4	Verification of Maximum Power Transfer Theorem	4
5	Verification of Telegen's and Reciprocity Theorem	5
6	Time domain response of RC Transient Circuit	6
7	Time domain response of RL Transient Circuit	6
8	Series RLC Resonance Circuits(Frequency response& Resonant frequency)	8
9	Parallel RLC Resonance Circuits(Frequency response & Resonant frequency)	9
10	Simulation experiments using PSPICE or MultiSim	10

Mini Project: Students are instructed to do a mini project at the end of semester. Batch members for mini project is same as regular lab batch.

Evaluation methods

Lab performance/Observation-		15%
Report	-	15%
Attendance	-	05%
Mini Project	-	05%
Model exam	-	20%
Final exam	-	40%

Laboratory Policies and Report Format

Reports are due at the beginning of the lab period. The reports are intended to be a complete documentation of the work done in preparation for and during the lab. The report should be complete so that someone else familiar with digital design could use it to verify your work. The pre-lab and post-lab report format is as follows:

1. A neat thorough pre-lab must be presented to your Staff In-charge at the beginning of your scheduled lab period. **Lab reports should be submitted on A4 paper.** Your report is a

professional presentation of your work in the lab. Neatness, organization, and completeness will be rewarded. Points will be deducted for any part that is not clear.

2. In this laboratory students will work in teams of three. However, the lab reports will be written individually. Please use the following format for your lab reports.
    a. **Cover Page:** Include your name, Subject Code, Section No., Experiment No. and Date.
    b. **Objectives:** Enumerate 3 or 4 of the topics that you think the lab will teach you. DO NOT REPEAT the wording in the lab manual procedures. There should be one or two sentences per objective. Remember, you should write about what you will learn, not what you will do.
    c. **Design:** This part contains all the steps required to arrive at your final circuit. This should include diagrams, tables, equations, theoretical calculation etc. Be sure to reproduce any tables you completed for the lab. **This section should also include a clear written description of your design process.** Simply including a circuit schematic is not sufficient.
    d. **Questions:** Specific questions (Pre-lab and Post-lab) asked in the lab should be answered in the observation notebook. **Retype the questions presented in the lab and then formally answer them.**
3. Your work must be original and prepared independently. However, if you need any guidance or have any questions or problems, please do not hesitate to approach your staff in-charge during office hours. The students should follow the dress code in the Lab session.
4. Each laboratory exercise (circuit) must be completed and demonstrated to your Staff In-charge in order to receive working circuit credit. This is the procedure to follow:
    a. Circuit works: If the circuit works during the lab period (3 hours), call your staff in-charge, and he/she will sign and date it.. This is the end of this lab, and you will get a complete grade for this portion of the lab.
    b. Circuit does not work: If the circuit does not work, you must make use of the open times for the lab room to complete your circuit. When your circuit is ready, contact your staff in-charge to set up a time when the two of you can meet to check your circuit.
5. Attendance at your regularly scheduled lab period is required. An unexpected absence will result in loss of credit for your lab. If for valid reason a student misses a lab, or makes a reasonable request in advance of the class meeting, it is permissible for the student to do the lab in a different section later in the week if approved by the staff in-charge of both the sections. Habitually late students (i.e., students late more than 15 minutes more than once) will receive 10 point reductions in their grades for each occurrence following the first.
7. **Reports Due Dates**: Reports are due one week after completion of the corresponding lab.
8. **Systems of Tests:** Regular laboratory class work over the full semester will carry a weightage of 60%. The remaining 40% weightage will be given by conducting an end semester practical examination for every individual student if possible or by conducting a 1 to 1 ½ hours duration common written test for all students, based on all the experiment carried out in the semester.
9. **General Procedure**
    a. Properly place the components in the general purpose breadboard and identify the positive and negative terminals of the power supply, before making connection.
    b. Keep the required supply voltage in Power supply and connect power supply voltage and ground terminals to the respective node points in the breadboard.

c. Connect the components as per the circuit diagram, after verifying connection switch on the supply and note down the required parameter values

d. After the completion of the experiments switch off the power supply and return the components.

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Prepared by: Mr. K. Kalimuthu, Department of ECE

Dated: **30**th December 2013 **Revision No.:** 00 **Date of revision:** NA

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Program Educational Objectives

1. To prepare students to compete for a successful career in Electronics and Communication Engineering profession through global education standards.
2. To enable the students to aptly apply their acquired knowledge in basic sciences and mathematics in solving Electronics and Communication Engineering problems.
3. To produce skillful graduates to analyze, design and develop a system/component/ process for the required needs under the realistic constraints.
4. To train the students to approach ethically any multidisciplinary engineering challenges with economic, environmental and social contexts
5. To create an awareness among the students about the need for life long learning to succeed in their professional career as Electronics and Communication Engineers.

Course Teacher	Sec	Batch	Signature
Mr.A.Joshua Jafferson	A	A	
	G	B	
Mr.T.Saminathan	B	A	
	F	B	
Mrs.C. R. Uma Kumari	C	A	
	H	B	
Mr.K.Kalimuthu	D	A	
	E	B	
Mrs.V.Sarada	E	A	
	J	B	
Mr.B.Srinath	F	A	
	A	B	
Mrs.E.Chitra	G	A	
	B	B	
Mrs. T.Theresal	H	A	
	C	B	
Mr.S.Manikandaswamy	I	A	
	D	B	
Mrs. M.K.Srilekha	J	A	
	I	B	

Course Coordinator
(K.Kalimuthu)

Academic Coordinator
(Mrs.N.Saraswathi)

Professor In-Charge
(Dr.B.Ramachandran)

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