Course Description

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

EC1014 Electronic Circuits Laboratory

Fourth Semester, 2014-15 (Even semester)

Course description

This course is designed to provide students with fundamental concepts of Electronic Circuits for lab experience. Transient analysis and frequency response of Single and Multistage BJT and FET Amplifier. Study of operation of Oscillators and Waveform generators like Multivibrators and Schmitt trigger. Study of frequency response of Tuned and Feedback Amplifier. Application of simulation tools (PSPICE or Multisim) to understand the circuit characteristics.

Compulsory/Elective course: Compulsory for ECE students

Credit hours: 2 credits

Venue(s): TP9L2-Electron Devices Lab (E, H, K), TP10L3- Electronic Circuits Lab (A,C,G,J), TP10L4 – Communication Engineering Lab (B, D, F, I)

Course coordinator: Ms. A. Ramya Assistant Professor (OG), Department of ECE

Instructor(s)

Name of the instructor	Class handling	Office location	Office phone	Email
Mrs. G. Kalaimagal	A	TP1203A	2062	kalaimagal.g@ktr.srmuniv.ac.in
Mrs. S. Hannah Pauline	B	TP903A	2058	hannahpauline.s@ktr.srmuniv.ac.in
Mrs. S. Kayalvizhi	C	TP12S7	2087	kayalvizhi.s@ktr.srmuniv.ac.in
Mr. B. Srinath	D	TP1106A	2063	srinath.b@ktr.srmuniv.ac.in
Mr. M. Mohana Sundaram	E	TP1106A	2063	mohanasundharam.m@ktr.srmuniv.ac.in
Mr. G. Elavel Viswanathan	F	TP10S4	-	elavelviswanathan.g@ktr.srmuniv.ac.in
Mrs. S. Latha	G	TP903A	2058	latha.su@ktr.srmuniv.ac.in
Mrs. C. R. Uma Kumari	H	TP1203A	2064	umakumari.c@ktr.srmuniv.ac.in

Name of the instructor	Class handling	Office location	Office phone	Email
Mrs. B. Sudha	I	TP106A	2058	sudha.b@ktr.srmuniv.ac.in
Ms. A. Ramya	J	TP1006A	2061	ramya.a@ ktr.srmuniv.ac.in
Ms. A. Bhavani	K	TP1006A	2061	bhavani.a@ktr.srmuniv.ac.in

Relationship to other courses

Pre-requisites:

EC1001 Basic Electronics Engineering
EC1003 Electric Circuits
EC1006 Electron Devices

Assumed knowledge:

Electronics and Electric circuit concepts

Following courses:

EC1020 Communication Engineering Lab

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

References

1. "LAB MANUAL", Department of ECE, SRM University
2. Paul B Zbar and Albert P Malvino, Michael A Miller, "Basic Electronics: A Text Lab Manual", 7th edition, Tata McGraw Hill, 2009.
3. David A Bell, "Laboratory Manual for Electronic Devices and Circuits", 4th edition, PHI, 2001.
4. David A Bell, "Laboratory Manual for Operational Amplifiers & Linear ICs", 2nd edition, PHI
5. Muhammed H Rashid, "SPICE for circuits and electronics using PSPICE", 2nd edition, PHI, 1995.
6. L K Maheswari and M M S Anand, "Laboratory Manual for Introductory Electronic Experiments", New Age, 2010.

Computer usage

PSPICE or Multisim may be used to facilitate analysis, design and constructions of logic circuits.

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 150 minutes lab session per week, for 13-14 weeks

Section	Schedule
A	Day 1 (5,6,7); Day 4 (2,3,4)
B	Day 1 (5,6,7); Day 4 (2,3,4)
C	Day 2 (2,3,4); Day 5 (5,6,7)
D	Day 2 (2,3,4); Day 5 (5,6,7)
E	Day 2 (2,3,4); Day 5 (5,6,7)
F	Day 1 (2,3,4); Day 2 (5,6,7)
G	Day 1 (2,3,4); Day 2 (5,6,7)
H	Day 1 (2,3,4); Day 2 (5,6,7)
I	Day 3 (2,3,4); Day 4 (5,6,7)
J	Day 3 (2,3,4); Day 4 (5,6,7)
K	Day 3 (2,3,4); Day 4 (5,6,7)

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 Biasing network for BJT and FET, transient analysis and frequency response of BJT and FET in single stage and multistage amplifier	**(1),(2), (3)**
2. To understand the frequency response feedback amplifier using BJT and FET and Tuned amplifier	**(1),(2), (3)**
3. To understand the operation of Oscillators and waveform generators	**(2), (3)**

Course Learning Outcome

This course provides students the fundamental concepts of Electron Devices. 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 study experimentally the transient analysis and frequency response of single stage and multistage amplifier using BJT's and FET's.	c, d	f, j	
2. To verify practically the frequency response of feedback amplifier and single tuned amplifier	c, d	f , j	
3. To study practically the operation of oscillators and waveform generators	c, d	f , j	
3. To construct and simulate various electronics circuits using tools such as Pspice/multisim and study the response.	f,j		

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

Course Topics

No.	Lab Experiments	Sessions
1	Biasing networks for BJT (Fixed and Voltage divider Bias methods)	1
2	Transient analysis and Frequency response of Single stage BJT Amplifier.	2
3	Transient analysis and Frequency response of Multi stage BJT Amplifier.	3
4	Frequency response of BJT Feedback Amplifiers (Voltage Shunt, Current Series)	4, 5
5	Transistor Oscillators (Colpitts & RC Phase Shift)	6, 7
6	Frequency response of Single Tuned Amplifier	8
7	Transistor Multivibrator (Monostable) and Schmitt trigger	9, 10
8	Simulation Experiments using PSPICE or Multisim (Astable Multivibrator and Biasing Networks for FET(Self Bias and Voltage divider Bias))	11, 12
9	Repeat Class	13

Evaluation methods

Attendance	-	05%
Lab Performance	-	10%
Prelab	-	05%
Post Lab	-	05%
Report	-	10%
Miniproject	-	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 electronic design could use it to verify your work. The prelab and postlab report format is as follows:

1. A neat thorough prelab must be presented to your faculty Incharge 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, explanations, 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 (Prelab and Postlab) asked in the lab should be answered here. **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 faculty incharge during office hours. Copying any prelab/postlab will result in a grade of 0. The incident will be formally reported to the University and the students should follow the dress code in the Lab session.

4. Each laboratory exercise (circuit) must be completed and demonstrated to your faculty Incharge 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 faculty incharge, 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 faculty incharge 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 faculty incharge 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. **Student attendance less than 75% is detention**.

6. Final grade in this course will be based on laboratory assignments. All labs have an equal weight in the final grade. Grading will be based on pre-lab work, laboratory reports, post-lab and in-lab

performance (i.e., completing lab, answering laboratory related questions, etc.,).The faculty Incharge will ask pertinent questions to individual members of a team at random. Labs will be graded as per the following grading policy:

Attendance	-	05%
Lab Performance	-	10%
Prelab	-	05%
Post Lab	-	05%
Report	-	10%
Miniproject	-	05%
Model Exam	-	20%
Final exam	-	40%

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 Procedures

a) Properly place the components in the breadboard as per circuit diagram, and identify the different input and outputs of the circuit before making connection.
b) Know the biasing voltage required for different devices and connect power supply voltage.
c) Note down the readings obtained from the CRO or Measuring devices in the observation book.
d) Plot the graph on a linear graph or semi log graph and verify its characteristics using model graph.
e) After the completion of the experiments switch off the power supply and return the components.

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Prepared by: Ms. A. Ramya, Assistant Professor (OG), Department of ECE

Dated: 5th January 2015 **Revision No.:** 00 **Date of revision:** NA

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Addendum

ABET Outcomes expected of graduates of B.Tech / ECE / program by the time that they graduate:

a. Graduates will demonstrate knowledge of mathematics, science and engineering.

b. Graduates will demonstrate the ability to identify, formulate and solve engineering problems.

c. Graduate will demonstrate the ability to design and conduct experiments, analyze and interpret data.

d. Graduates will demonstrate the ability to design a system, component or process as per needs and specifications.

e. Graduates will demonstrate the ability to visualize and work on laboratory and multi-disciplinary tasks.

f. Graduate will demonstrate the skills to use modern engineering tools, software's and equipment to analyze problems.

g. Graduates will demonstrate the knowledge of professional and ethical responsibilities.

h. Graduate will be able to communicate effectively in both verbal and written form.

i. Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.

j. Graduate will develop confidence for self education and ability for life-long learning.

k. Graduate will show the ability to participate and try to succeed in competitive examinations.

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 awareness among the students about the need for life long learning to succeed in their professional career as Electronics and Communication Engineers.

Course Teacher	Class & Section	Signature
Mrs. G. Kalaimagal	IV Sem 'A'	
Mrs. S. Hannah Pauline	IV Sem 'B'	
Mrs. S. Kayalvizhi	IV Sem 'C'	
Mr. B. Srinath	IV Sem 'D'	
Mr. M. Mohana Sundaram	IV Sem 'E'	
Mr. G. Elavel Viswanathan	IV Sem 'F'	
Mrs. S. Latha	IV Sem 'G'	
Mrs. C. R. Uma Kumari	IV Sem 'H'	
Mrs. B. Sudha	IV Sem 'I'	
Ms. A. Ramya	IV Sem 'J'	
Ms. A. Bhavani	IV Sem 'K'	

Course Coordinator
(Ms. A. Ramya)

Academic Coordinator
(Mrs. N. Saraswathi)

Professor In-Charge
(Dr. B. Ramachandran)

2014 B. Tech. â€“ Fourth Semester AERODYNAMICS-I (AE-401) Time: 3 hrs Max Marks: 100 No. of pages: 2 Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.Â 15 8/4 Q.3 Direct stresses of 160 N/mm2 (tension) and 120 N/mm2 (compression) are applied at a particular point in an elastic material on two mutually perpendicular planes. The principal stress in the material is limited to 200 N/mm2 (tension). Calculate the allowable value of shear stress at the point on the given planes. Academic year 2014-15 Semester First. The departments/IDPs are requested to prepare their respective departmental time tables strictly as per instructions given in this document (see page 11 Preparation of Departmental time table Links).Â 7. Four HSS-1 courses will be offered every semester in L3-L6 (max. registration 125) primarily for 3rd and 4th semester students. 8. COM200 will be offered in T10:00 â€“ 11:50 slot in L7 in the odd semester for Batch A students (as assigned earlier for 1st year courses), i.e., a total of 416 students. 9. COM200 will be offered in Th9:00 â€“ 10:50 slot in L7 in the even semester for Batch B students (as assigned earlier for 1st year courses), i.e., a total of 417 students. Naming of ESO/SO Courses. Course Name: Diploma in Chemical Engineering. Duration: 3 Years Eligibility: 10th with Math and Science Lateral Entry: 10+2 PCM / ITI (2years)/ 2 years Vocational Course in Relevant Trade / 3 year Apprenticeship. Semester 1st. Code. DF1 DF2 DF3 DF4 DF5-L DF6-L.Â Semester 4th. Code. DSH7 DSH8 DSH9 DSH10 DSH8-L DSH11-L. 1 Lectures and Seminars in English Winter Semester 2014/15 at the Professorship for Adult and Continuing Education Dear Students, In the following you can find our lectures offered in English language at the Professorship for Adult and Continuing Education in winter semester 2014/15. Many of the lectures are offered by international guest professors. So you will have the possibility to study in an international environment in WÃ¼rzburg. Especially during the winter school you are going to have the opportunity to meet many international students from Europe! As the number of our Incoming Student Semester, trimester and quarter are all synonyms for an academic term (the last two being mainly confined to American English),[1] which refer to terms of specific periods as described below: Semester (Latin: sÄ“mestris, lit. 'six monthly') originally German, where it referred to a university session of six months, adopted into American usage in the early 19th century as a half-year term of typically 15 to 18 weeks.Â First term begins in the second week of September and continues for 15 weeks, ending in mid-December, excluding one week for mid-term break in mid-October. Second term begins in the first week of January and continues for 12 weeks, ending at the end of March. Third term begins mid-April and continues for 11 weeks until the end of June.