NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Department of Electrical and Electronics Engineering

COURSE PLAN – PART I			
Course Title	**Circuits and Devices Laboratory**		
Course Code	**EELR10**	**No. of Credits**	**2**
Department	**EEE (III Sem. Sec- B)**	**Faculty**	**Dr. N. Kumaresan**
Pre-requisites Course Code	**Pre-requisite : EEPC10 Electron Devices** **Co-requisite : EEPC11 Circuit Theory**		
Course Coordinator(s) (if, applicable)			
Other Course Teacher(s)/Tutor(s) E-mail		**Telephone No.**	**0431-2503257**
Course Type	☑ **Core course**	☐ **Elective course**	
Syllabus (approved in BoS)			

EELR10 - CIRCUITS AND DEVICES LABORATORY

Course Type: Essential Laboratory Requirement (ELR)   **Co-requisites:** EEPC11
No. of Credits: 2

Course Objectives:

- To understand and analyze the basic theorems of Circuit theory
- Understand and analyze series & parallel circuits and measurement of single and three-phase power.
- Understand and analyze different applications of diode and characteristics of Transistor.

List of Experiments

- Characteristics of CB and CE configuration of BJT.

- I-V Characteristics of p-channel and n-channel MOSFET.

- Verification of Thevenin and Maximum Power Transfer Theorem.

- Verification of Superposition Theorem.

- Verification of Kirchhoff's Current and Voltage law.

- Transient characteristics of R-L series circuit.

- Transient characteristics of R-C series circuit.

- Transient characteristics of R-L-C series circuit.

Mini-Project

COURSE OBJECTIVES

To understand and analyze the basic theorems of Circuit theory.
Understand and analyze series & parallel circuits and measurement of single and three phase power
Understand and analyze different applications of diode and characteristics of Transistor.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)			
Upon completion of the course, the students will be able to 1. Verify the network theorems and operation of typical electrical and electronic circuits. 2. Choose the appropriate equipment for measuring electrical quantities and verify the same for different circuits. 3. Prepare the technical report on the experiments carried.	COs / POs	Course outcomes(COs)		
		1	2	3
	1	H	H	H
	2	H	H	H
	3	H	H	H
	4	NA	NA	NA
	5	NA	NA	NA
	6	H	H	H
	7	NA	NA	NA
	8	H	H	H
	9	H	H	H
	10	H	H	H
	11	H	H	H
	12	H	H	H
	13	H	H	H
	14	H	H	H

(Programme Outcomes (POs))

COURSE PLAN – PART II

COURSE OVERVIEW

One common approach for getting students actively involved in the learning process is through laboratory classes. So, the laboratory is an exciting place where students investigate, analyze, and reflect. They test and apply theories and make abstract concepts concrete. Hence, laboratory classes provide students with first-hand experience with course concepts. Therefore, following are the learning objectives through the laboratory experiments for any students: (i) understanding of concepts, (ii) developing experimental skills (e.g., design, observation, and use of equipment), (iii) developing communication skills, including those involved in working in groups. (iv) developing data analysis skills, (v) developing thinking skills (critical, quantitative, qualitative), (vi) directly experiencing phenomena, (vii) connecting book knowledge to real-world applications and (viii) applying concepts to new situations and solve authentic problems.

In this laboratory, students will verify the circuit theorems and I-V characteristics of electronic devices. Students will be assessed in each laboratory class / exercise based on their preparation (i.e., knowledge on theoretical concepts, circuit diagram, experimental procedure, precautions, typical characteristics, formulae and tabular column); making connections; conducting experiments; taking readings; calculating performance quantities; plotting characteristics and bringing out inferences. Mini project is also aimed for this laboratory course.

Safety is an important concern in Electrical Laboratories and hence, it is instructed that all the students should follow strictly the safety rules / guidelines.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No	Week	Topic	Mode of Delivery
1.	2nd week of July '18 (9 to 13)	Demonstration and use of Bread board, Variable regulated power supply, Function generator, Digital Storage Oscilloscope, Multi meters, etc.	Laboratory demonstration
2.	3rd and 4th week of July '18 (16 to 27)	Characteristics of CB and CE configuration of BJT	Conducting experiment in the Laboratory
3.	30.07.18 to 04.08.2018	Characteristics of MOSFET	
4.	2nd week of August '18 (6 to 10)	Verification of Kirchhoff's Current and Voltage law.	
5.	3rd week of August '18 (13 to 17)	Verification of Thevenin and Maximum Power Transfer Theorem.	
6.	4th week of August '18 (20 to 24)	Verification of Superposition Theorem.	Conducting experiment in the Laboratory
7.	5th week of August '18 (27 - 31)	Assessment : Quiz	Date and time will be announced later
8.	1st week of September '18 (4 - 7)	1. Single-phase Resistive circuit 2. Single-phase RL series circuit 3. Single-phase RC series circuit	Demonstration in the laboratory
9.	2nd & 3rd week of September '18 (11 - 20)	4. Three-phase circuits : -measurement of power, current and power factor	
10.	4th week of September (24 – 28)	• Transient characteristics of RL series circuit. • Transient characteristics of RC series circuit. Transient characteristics of RLC series circuit.	Conducting experiment in the Laboratory
11.	October '18	**Mini project**	Assessment criteria will be informed later
		Introduction to offline simulation Simulation of circuit transients – using c/c++ programming **(Assessment-4 : Offline simulation of circuits : 20 marks)**	
12.	1st week of November '18	Assessment – Lab exam	Date and time will be announced later

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Internal assessment	During regular laboratory classes	3 hours in each lab class	50 %
2.	Quiz	3rd week of August '18	45 Minutes	10 %
3.	Lab exam	1st week of November '18	1 hour	20 %
4.	Mini project	4th week of October '18		20 %

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc
1. Text / references mentioned in EEPC10 Electron Devices and EEPC11 Circuit Theory courses 2. Lab manual which will be supplied by the faculty handling the lab

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)
Feedback from the students during class committee meetings Anonymous feedback through questionnaire

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

ATTENDANCE

As prescribed by the Office of the Dean (Academic).

Grading the students

1. Grading will be based on the clusters (range) of the total marks (all the assessments i.e., Assessment 1 to 4, put together for each student) scored. For grading, Gap theory or Normalized curve method will be used to decide the clusters (range) of the total marks.
2. The passing minimum shall be as per the Office of the Dean (Academic) instructions. Hence, every student is expected to score the minimum mark to pass the course as prescribed by the Office of the Dean (Academic). Otherwise the student would be declared fail and 'F' grade will be awarded.

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD for necessary action.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

ADDITIONAL COURSE INFORMATION

CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail.
2. Queries (if required) may be emailed to me / contact me during the lab sessions for any clarifications.

FOR APPROVAL

Course Faculty _____ 9/7/18   CC-Chairperson _____ 9/7/2018   HOD