

B.E. Semester: 3
Electronics & Communication Engineering
Subject Name: Electronics Workshop -II
Subject Code: EC-306

A. Learning Objectives:

- To present a problem oriented introductory knowledge of Electronic circuits.
- To address the underlying concepts and methods of designing and simulation of electronic circuits.

B. Teaching/Examination Scheme:

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
		EC 306	Electronic Workshop II	0	0		2	2	1	0	00	

Outline of the Course:

Sr. No.	Title of the Unit
1	Introduction.
2	Basics of Simulation Software
3	Tutorial Lessons
4	Interactive Computation
5	Programming in Software
6	Application.
7.	Hardware of simulated circuit.

- **Total Hours (Lab) : 30**
- **Total Hours : 30**

Project guideline:

1. The project should be strictly software and hardware based
2. The project can be carried out individually or in a group
3. The project work involves simulation, fabrication, testing, calibration (if required) work of some Electronic circuit
4. The project should be defended by adequate documentation & presentation.

C. Instructional Methods and Pedagogy :

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. Laboratory Sessions using Multimedia Projector and Software will be taken.
3. Students will be asked to present conducted laboratory report to instructor for marks evaluation.
4. Attendance is compulsory in laboratory which carries 5% weight of overall evaluation.

D. Suggested List of Experiments :

Laboratories should include

Simulation of following circuits using Labview/spice (Schematic entry of circuits using standard packages. Analysis- transient, AC, DC, etc.):

1. Potential divider.
2. Integrator & Differentiator (I/P PULSE) – Frequency response of RC circuits.
3. Diode, BJT, FET, MOSFET Characteristics.
4. Simulate and study half-wave, full-wave, and bridge-rectifier.
5. Simulate and study diode clipper and clamper circuits.
6. Voltage Regulators.
7. Simulate and study emitter bias and fixed bias BJT and JFET circuits and determine quiescent conditions.
8. Simulate a common emitter amplifier using self biasing and study the effect of variation in emitter resistor on voltage gain, input and output impedance.
9. Determine the frequency response of V_o/V_s for CE BJT amplifier. Study the effect of cascading of two stages on band width.
10. Simulate and study Darlington pair amplifier circuit and determine dc bias and output ac voltage
11. Simulate RC Coupled amplifiers - Transient analysis and Frequency response.
12. Simulate FET & MOSFET amplifiers.
13. Simulate Multivibrators.
14. Simulate Oscillators (RF & AF).
15. Study an operational amplifier and find out: CMMR, gain band width product, slew rate, 3-db frequency, and input offset voltage.
16. Simulate and study active low pass, high pass, and band pass filters.
17. Simulate and study class A, B, C, and AB amplifier.
18. Study the operation of 555 timer oscillator.
19. Simulate logic expression and determine its truth table.
20. Simulate logic expression of full adder circuit and determine its truth table.
21. Simulate a synchronous 4-bit counter and determine its count sequence.
22. Simulate a master-slave flip-flop using NAND gates and study its operation. Study the operation of asynchronous preset and clear.

E. Student Learning Outcomes :

1. Able to understand designing of electronic circuits
2. Able to design different electronics projects