Program :	**Diploma in Electronics/ Electronics and Communication Engineering/ Biomedical Engineering**
Course Code :**3047**	Course Title: **Electronic Circuits Lab**
Semester :**3**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0, T:0, P:3)**	Periods per semester:**45**

CourseObjectives:

- To provide hands-on experience with basic electronic devices and circuits.
- To study the characteristics of electronic devices,
- To impart design procedures of electronic circuits.
- To develop trouble shooting skills.
- To familiarize with the usage of various electronic instruments and measuring equipment.

Course Prerequisites:

Topic	Course code	Course name	Semester
Knowledge of basic Mathematics		Mathematics I,II	1 & 2
Experiments with electric circuits and electronic components		Fundamentals of Electrical &Electronics lab	2
Characteristics of diodes and transistors		Basic Electronics	2

Course Outcomes:

On completion of the course, the students will be able to:

COn	Description	Duration (Hours)	Cognitive level
CO1	Experiment with the input and output characteristics of BJT, FET and UJT	9	Applying
CO2	Design transistor based amplifier circuits.	12	Applying
CO3	Design low frequency and high frequency oscillator circuits	9	Applying
CO4	Design transistor based switching circuits.	9	Applying
	Lab Exam	6	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3		3				
CO3	3		3				
CO4	3		3				

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Experiment with the input and output characteristics of BJT, FET and UJT**		
M1.01	Build the circuit and plot the input characteristics of BJT in CE configuration	3	Applying
M1.02	Construct the circuit and plot the output characteristics of BJT in CE configuration	3	Applying
M1.03	Construct the circuit and plot the output characteristics (drain characteristics) of FET (CS configuration)	3	Applying
CO2	**Design transistor based amplifier circuits.**		
M2.01	Design a single stage CE amplifier with potential divider bias and 1) Observe the phase difference between input and output waveforms 2) Measure mid band gain	3	Applying
M2.02	Design a single stage CE amplifier with potential divider bias and 1) Plot its frequency response and 2) Measure the bandwidth	3	Applying
M2.03	Build an emitter follower circuit and 1) Observe the phase difference between input and output 2) Measure the gain 3) Plot its input / output waveforms	3	Applying
M2.04	Construct a single stage tuned amplifier circuit and 1) Plot input/output waveforms 2) Measure its peak gain 3) Plot its frequency response and 4) Measure the bandwidth	3	Applying

	Lab Exam I	3	
CO3	**Design low frequency and high frequency oscillator circuits**		
M3.01	Design a RC phase shift oscillator and 1) Plot the output waveform 2) Measure the frequency of oscillation	3	Applying
M3.02	Design a Hartley oscillator and 1) Plot the output waveform 2) Measure the frequency of oscillation	3	Applying
M3.03	Construct a Crystal oscillator circuit and 1) Plot the output waveform 2) Measure the frequency of oscillation	3	Applying
CO4	**Design transistor based switching circuits.**		
M4.01	Design an Astable multivibrator circuit using transistor and 1) Plot the collector and base waveforms 2) Measure the frequency of oscillation	3	Applying
M4.02	Construct a Schmitt trigger circuit using BJT and 1) Plot the input output waveforms 2) Measure the UTP and LTP voltages	3	Applying
M4.03	Design a UJT relaxation oscillator and plot the emitter and base waveforms.	3	Applying
	Lab Exam II	3	

Student Activity

Suggested Open-ended Experiments:

Students can do open ended experiments as a group of 2-3. There is no duplication in experiments in between groups. This is mainly for the purpose of continuous internal evaluation. Students should include the open ended experiment in their lab record. Give preference to circuits with discrete components.

Example:

1. Complimentary Symmetry Audio Amplifier
2. Burglar Alarm Using Transistor.
3. Touch Door Bell Alarm (Without IC)

Text /Reference:

T/R	Book Title/Author
R1	K A Navas - Electronics Lab Manual Volume 1, Fifth Edition - PHI
R2	N N Bhargava, Kulshreshtha and S C Gupta- Basic Electronics and Linear Circuits- TMH

OnlineResources:

Sl.No	Website Link
1	http://ece.anits.edu.in
2	http://mjcollege.ac.in
3	http://www.crectirupati.com
4	https://studentboxoffice.in
5	https://www.iare.ac.in

Sample Questions to Test Outcomes

1. Design and set up an RC phase shift oscillator, plot the output waveform and measure the frequency of oscillation.
2. Design and set up a single stage CE amplifier circuit, plot the frequency response and measure the mid band gain and bandwidth.