

Devi Ahilya University, Indore, India Institute of Engineering & Technology				II Year B.E. (Electronics and Telecommunication Engg.)			
Subject Code & Name	Instructions Hours per Week			Credits			
4ETRL2 ELECTRONIC WORKSHOP	L	T	P	L	T	P	Total
	0	0	2	0	0	1	1

Learning Objectives:

- To familiarize students with various Electronic devices and their specifications.
- Develop skill for Design and Testing of different types of Electronic subsystems using Analog and Digital IC's
- Familiarize students with PCB layout tool to prepare PCB print for assigned project.
- Develop skills of writing a structured technical document for project and its presentation.
- Develop ability to diagnose faults and their rectification.

COURSE CONTENTS

List of Exercises / Experiments

1. Familiarization /Identification of electronic components with specification and Functionality, type, size, colour coding, package, symbol, cost etc. Active, Passive, Electrical, Electronic, Electro-mechanical, Wires, Cables, Connectors, Fuses, Switches, Relays, Crystals, Displays, Fasteners, Heat sink etc.
2. Drawing of electronic circuit diagrams using EDA tools, Interpret data sheets of discrete components and IC's, Estimation and costing.
3. Familiarization/Application of testing instruments and commonly used tools like Multimeter, Function generator, Power supply, CRO etc. Soldering iron, De-soldering pump, Cutters, Wire strippers, Screw drivers, Hot air soldering and desoldering station etc.
4. Testing of electronic components Resistor, Capacitor, Diode, Transistor, UJT and JFET using multimeter and different IC's using IC tester.
5. Design and fabrication of a single sided PCB for a simple circuit with manual etching (Ferric chloride) and drilling.]
6. Designing Circuit on TinaPro Software.
7. PCB Designing using PCB Prototyping Machine
8. Assembling electronic circuit/system on general purpose PCB, testing and show the functioning (**Total two projects. Any one from 1-13 and one from 14-18 project list**)

List of Projects

1. Fastest Finger First Indicator Project
2. Fire Alarm Circuit
3. Plant Watering Watching Indicator
4. Clap switch for operating electric equipment like fan, bulb
5. Mobile Battery Charger

6. 7 Segment Counter
7. Metal Detector
8. Electronic letter box
9. Traffic Light circuit
10. Light-Sensitive Fire Alarm
11. Infrared Motion-Sensing Relay Switch
12. LPG Leakage Detector
13. Motion Detector Using NE555 Timer
14. Design and implement a single stage voltage amplifier using BJT in common emitter configuration for a gain of 10 to amplify input voltage 10 mVp-p, 10-100 KHz. Also tabulate the results for different input range.
15. Design and implement a two stage R-C coupled amplifier using BJT in common emitter configuration for a gain of 100 to amplify input voltage 1mVp-p, 10-100 KHz. Also tabulate the results for different input range.
16. Design and implement LOW PASS, HIGH PASS filter using OP-AMP with cut off frequency 10 KHz and a bandpass filter with passband of 100 KHz.
17. Design and implement variable frequency and variable amplitude triangular waveform generator using OP-AMP. Tabulate the frequency range and amplitude range for the implemented circuit.
18. Design and implement variable frequency and variable amplitude square waveform generator using OP-AMP. Tabulate the frequency range and amplitude range for the implemented circuit.

Learning Outcomes:

Upon completing the course, students will be able to design, test and implement any Analog or Digital circuit by making use of the various tools and instruments available in the Electronics Workshop

BOOKS RECOMMENDED:

- [1] K. A. Navas, "Electronics Lab Manual", Volume I, PHI, 5th Edition, 2015, ISBN: 9788120351424
- [2] R.A Penfold, "Electronic Projects in Workshop", Newnes Technical Books
- [3] T.K Hamingway, "Electronic Designer's Handbook", Business Books Limited.