

<b>Devi Ahilya University, Indore, India Institute of Engineering &amp; Technology</b>				<b>II Year B.E. (Electronics and Telecommunication Engg.)</b>			
<b>Subject Code &amp; Name</b>	<b>Instructions Hours per Week</b>			<b>Credits</b>			
<b>ETR3L1 ELECTRONIC WORKSHOP-I</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Total</b>
<b>Duration of Theory Paper:</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>

### **Learning Objectives:**

This course gives the basic introduction of electronic hardware systems and provides hands-on training with familiarization, identification, testing, assembling, dismantling, fabrication and repairing such systems by making use of the various tools and instruments available in the Electronics Workshop.

### **Prerequisites:**

None

### **List of Exercises / Experiments (Minimum of 8 mandatory)**

1. Familiarization/Identification of electronic components with specification :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 BIS/IEEE symbols and introduction to EDA tools, Interpretation of data sheets of discrete components and ICs, Estimation and costing.
3. Familiarization/Application of testing instruments and commonly used tools : 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.
5. Inter-connection methods and soldering practice. : Bread board, Soldering - types - selection of materials and safety precautions, soldering practices in connectors and general purpose PCB, Crimping.
6. Printed circuit boards (PCB) : Types, Single sided, Double sided, Processing methods, Design and fabrication of a single sided PCB for a simple circuit with manual etching using Ferric chloride and drilling.

7. Assembling of electronic circuit/system on general purpose PCB, test and demonstration of functioning (**Any Four circuits**)
- A. Fixed voltage power supply with transformer, rectifier diode, capacitor filter, zener/IC regulator.
  - B. LED blinking circuit using a stable multi-vibrator with transistor BC 107.
  - C. Square wave generation using IC 555 timer.
  - D. Sine wave generation using IC 741 OP-AMP.
  - E. RC coupled amplifier with transistor BC 107.

### **Learning Outcomes:**

Student can identify the active and passive electronic components. Student gets hands-on experience on assembling, testing, dismantling, fabrication and repairing systems by making use of the various tools and instruments available in the Electronics Workshop.

### **BOOKS RECOMMENDED:**

[1] R S Khandpur, "*Printed Circuit Boards - Design Fabrication, Assembly and Testing*", Tata Mc Graw Hill Publishing Company Limited, 1st edition 2008.

[2] Horowitz and Hill, "*The Art of Electronics 2nd Edition*", 1989/1990 Cambridge University Press