Course No.	Course Name	L-T-P-Credits	Year of Introduction
EC110	**ELECTRONICS ENGINEERING WORKSHOP**	**0-0-2-1**	**2016**

Course 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.

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, Interpret data sheets of discrete components and IC's, 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, Pliers, Cutters, Wire strippers, Screw drivers, Tweezers, Crimping tool, Hot air soldering and de-soldering 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, Wrapping, Crimping, Soldering - types - selection of materials and safety precautions, soldering practice in connectors and general purpose PCB, Crimping.]

6. Printed circuit boards (PCB) [Types, Single sided, Double sided, PTH, Processing methods, Design and fabrication of a single sided PCB for a simple circuit with manual etching (Ferric chloride) and drilling.]

7. Assembling of electronic circuit/system on general purpose PCB, test and show the functioning(**Any Four circuits)**

    1. Fixed voltage power supply with transformer, rectifier diode, capacitor filter, zener/IC regulator.
    2. LED blinking circuit using a stable multi-vibrator with transistor BC 107.
    3. Square wave generation using IC 555 timer in IC base.
    4. Sine wave generation using IC 741 OP-AMP in IC base.
    5. RC coupled amplifier with transistor BC 107.
    6. AND and NAND gates in diode transistor logic.

8.Familiarization of electronic systems (**Any three systems)**

1. Setting up of a PA system with different microphones, loud speakers, mixer etc.
2. Assembling and dismantling of desktop computer/laptop/mobile phones.
3. Coil/Transformer winding.
4. Identify the subsystems of TV, DTH, CCTV, Cable TV, CRO, Function generator etc.
5. Screen printing and PCB pattern transfer
6. Soldering & de-soldering of SMD using hot air soldering station.
7. Introduction to robotics- Familiarization of components (motor, sensors, battery etc.) used in robotics and assembling of simple robotic configurations.

Expected outcome

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