

ES102: ELECTRONICS WORKSHOP

CREDITS - 1 (LTP:0,0,1)

Course Objectives:

1. The goal of this course is to introduce basic principles of electronics workshop and establish the fundamentals of electronics components based projects as required for electronics and communication engineering students.
2. The course aims to make the student familiar with principles of electronics workshop like various electronics components, analog/digital troubleshooting, soldering techniques and PCB design, etc.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
L	T	P		Theory		Practical		
			ESE	CE	ESE	CE		
0	0	2	1	00	00	40	60	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	Introduction to Electronics Components: Resistor, Capacitor, Inductor, Diode, LEDs, Transistor, MOSFET, Thyristor, Relays, Op-Amp, ICs, Breadboard etc. Soldering techniques, stripping and tinning stranded wires, mounting components- plated through hole and surface mount technology, hand wire soldering, desoldering techniques, electrostatic discharge, SMD soldering techniques	06
2	Analog Troubleshooting: Electronics troubleshooting basics, troubleshooting with Oscilloscopes, signal injection and signal tracing, system analysis, diagnostics methods, servicing close loop circuits, troubleshooting noise and intermittent.	04
3	Digital Troubleshooting: Introduction to Superconductivity, General properties of superconductor Types of Superconductors, High Temperature Superconductors (only Definition), BCS Theory for Superconductivity, Applications of Superconductor	04
4	Study of Soldering Techniques and PCB Design: Students are expected to select any experiment. Soldering and testing is to be done for the selected experiment. Perform simulation of the same experiment by using CAD tools. Schematic as well as PCB design is to be carried out using CAD tools, Packages of Integrated Circuits (ICs) i.e. SOIC, PDIP, TQFP, MLFP, CBGA etc	06
5	Design and Implementation of Analog/Digital/Mix Mode Project:	08

BVM ENGINEERING COLLEGE [AN AUTONOMOUS INSTITUTION]

Students are expected to design any analog/digital/mix mode application of their choice. PCB design, fabrication of PCB, testing and implementation should be done. Documentation of the project is to be done in standard IEEE format. Project report should include abstract in maximum 100 words, keywords, introduction, design, simulation, implementation, results, conclusion and references. Example: Design and Implementation of DC Power Supply. (any other project can be taken in place of this example)

Total	28
--------------	-----------

References Books:

1. Jean Andrews; “*Enhanced Guide to managing and maintain your PC*”, Edition , 2001, Course Technology - Thomsan learning publishers.
2. Rashid M.H.; “*SPICE for Circuits and electronics using PSpice*”; Prentice Hall.
3. Boshart;”*Printed Circuit Boards: Design and Technology*” Tata McGraw Hill OrCAD/PCB II, User’s Guide.

Course Outcomes (COs):

At the end of this course, students will be able to:

1. Identification and testing of basic electronics Components.
2. Use of analog and digital instruments for troubleshooting.
3. Understand the operating function about basic instruments like CRO, Digital Storage Oscilloscope Power Supply, Function Generator and Digital Multi meter etc.
4. Design and development of PCB and soldering of components.
5. Build a small electronic circuit.