COURSE CODE	COURSE NAME	L	T	P	CREDIT	YEAR OF INTRODUCTION
100908/CO922U	ELECTRICAL & ELECTRONICS WORKSHOP	0	0	2	1	2020

Section 1 - Electrical Workshop

1. **Preamble:** Electrical Workshop is intended to impart skills to plan and carry out simple electrical wiring. It is essential for the practicing engineers to identify the basic practices and safety measures in electrical wiring.
2. **Prerequisite:** Nil
3. **Syllabus**

List of Exercises

Exercise 1

a) Demonstrate the precautionary steps adopted in case of Electrical shocks.

b) Identify different types of cables, wires, switches, fuses, fuse carriers, MCB, ELCB and MCCB with ratings.

Exercise 2

Wiring of simple light circuit for controlling light/ fan point. (PVC conduit wiring)

Exercise 3

Wiring of light/fan circuit using Two way switches. (Staircase wiring)

Exercise 4

Wiring of Fluorescent lamps and light sockets (6A) with a power circuit for controlling power device. (16A socket)

Exercise 5

Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, main switch and Energy meter.

Exercise 6

(a) Identify different types of batteries with their specifications.

(b) Demonstrate the Pipe and Plate Earthing Schemes using Charts/Site Visit.

4. **Course Outcomes:** After the completion of the course the student will be able to

CO1: Demonstrate safety measures against electric shocks

CO2: Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols

CO3: Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings.

5. **Mapping of course outcomes with program outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3						1
CO2	2									1		
CO3	2			1		1		1	2	2		2

6. **Assessment Pattern:**

Total marks allotted for the course is 50 marks. Continuous Internal evaluation (CIE) is conducted for 35 marks and End Semester Examination (ESE) of 15 marks. CIE should be done for the work done by the students and viva-voce. ESE shall be evaluated by written objective examination of one hour.

7. **Mark Distribution:**

Total	CIE			ESE
	Attendance	Class work/ Assessment /Viva-voce	Total	
50	10	25	35	15

8. **End Semester Examination Pattern:**

Written Objective Examination of one hour

Section 2 - Electronics Workshop

1. **Preamble:** Electronics Workshop is intended to impart skills to identify and test various electronic components and get hands-on assembling, dismantling, testing, fabrication and repairing systems by utilizing the tools available in the workshop.

1. **Prerequisite:** Nil

2. **Syllabus**

List of Exercises / Experiments (Minimum of 7 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 (such as Dia or XCircuit), 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, DSO 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 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 circuits using SMT (Surface Mount Technology) stations.

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

(i) Fixed voltage power supply with transformer, rectifier diode, capacitor filter, Zener /IC regulator.

(ii) Square wave generation using IC 555 timer in IC base.

(iii) Sine wave generation using IC 741 OP-AMP in IC base.

(iv) RC coupled amplifier with transistor BC107.

3. **Course Outcomes:** After the completion of the course the student will be able to

CO1: Identify and test various electronic components.

CO2: Draw circuit schematics with EDA tools.

CO3: Assemble and test electronic circuits on boards.

CO4: Work in a team with good interpersonal skills.

4. **Mapping of course outcomes with program outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	-	-	-	-	-	-	-	-	-	-	2
CO 2	3	-	-	-	2	-	-	-	-	-	-	2
CO 3	3	-	-	-	2	-	-	-	-	-	-	1
CO 4	-	-	-	-	-	-	-	-	3	2	-	2

5. Assessment Pattern:

Total marks allotted for the course is 50 marks. Continuous Internal evaluation (CIE) is conducted for 35 marks and End Semester Examination (ESE) of 15 marks. CIE should be done for the work done by the students and viva-voce. ESE shall be evaluated by written objective examination of one hour.

6. Mark Distribution

Total	CIE			ESE
	Attendance	Class work/ Assessment /Viva-voce	Total	
50	10	25	35	15

7. End Semester Examination Pattern

Written Objective Examination of one hour.