

Subject Code: 1ET4030101	Subject Title: Electrical Workshop Practices
Pre-Requisite	--

RATIONALE:

Selection of different types of wires, cables, switches etc. relevant to the current, voltage ratings and applications are required to be performed by the diploma electrical engineering students.

Such skills can be developed through the electrical workshop practices which will be useful in industries for using various electrical tools, measuring instruments, safety tools and devices.

This course is designed to identify and understand the different electrical tools, symbols and instruments.

The practicals performed in this course will develop basic skills related to the electrical engineering to perform well in the industry.

COURSE OBJECTIVE:

1. Identify various tools used for wiring.
2. Identify the symbols used in electrical circuit diagrams.
3. Identify and connect various electrical measuring instruments and measure current, voltage, power.
4. Identify different types of domestic wirings.
5. Identify and specify different types of wires, cables, cable joints used for different current and voltage ratings.
6. Identify and specify different types of switches
7. Identify and specify different types of conducting, insulating materials, resistors, capacitors and inductors.
8. Conduct mock artificial respiration and first aid exercises to learn about safety procedures of first aid in case of electrical hazards.
9. To learn soldering of various resistors, capacitors and electronic components on PCB.
10. Know the working of various electrical circuit protective devices (fuse, MCB)

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				Total (Marks)
Lecture	Tutorial	Practical	Credit	Theory		Practical		
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment	
-	-	4	2	-	-	-	50	50

DETAILS OF COURSE CONTENTS:

Sr. No	Topics and Sub-topics
1	Electrical Tools Pliers, nose plier, cutter, screw driver, tester, test lamp etc. Ammeter, voltmeter, wattmeter, clip on meter, Multimeter, Megger, etc.

2	Cables and Switches Single core cable, multicore cable, single strand wire, multi strand wire, shielded wire , different types of light sources etc.; Toggle switch, Rotary switch, Push button switch, micro switch, MCB, ELCB, etc.
3	Resistors Rheostate, wire wound resistor, Carbon film resistor, Carbon composition resistor, fixed and variable potentiometer etc.
4	Capacitors Paper capacitor, electrolytic capacitor, ceramic capacitor, polyester, gang capacitor
5	Earthing and Electrical Safety Pipe earthing, plate earthing, Electrical safety tools Electrical safety rules , I.E. rules for electrical hazards and accidents

COURSE OUTCOME:

The students will be able to

1. Understand various tools used for wiring, different types of domestic wirings and symbols used in electrical circuit diagrams.
2. Understand and Use various electrical measuring instruments and working of various protective devices (fuse, MCB,), different types of switches..
3. Understand different types of wires, cables, cable joints used for different current and voltage ratings.
4. Understand different types of conducting materials, insulating materials, resistors, capacitors and inductors and learn soldering and desoldering of various resistors, capacitors and electronic components on PCB.
5. Conduct mock artificial respiration and first aid exercises to learn about safety procedures of first aid in case of electrical hazards.

LIST OF PRACTICAL:

SR NO	PRACTICALS/EXPERIMENTS	HOURS
1	Identify and understand various tools used for wiring.	04
2	Identify the symbols used in electrical circuit diagrams.	04
3	Identify and connect various electrical measuring instruments and measure various electrical parameters like current, voltage, power.	04
4	Use common testing instruments used in electrical workshops: 1. Test lamp. 2. line tester. 3. Multimeter. 4. Clamp-on meter. 5. Megger.	04
5	Connect different domestic appliances to power supply and measure current drawn by them using 1)Ammeter. 2)Tong tester. 3)Multimeter.	04
6	Identify and understand different types of domestic wirings.	04
7	Identify and specify different types of wires, cables, cable joints used for different current and voltage ratings.	02

8	Identify different types of light sources, open circuit, closed circuit and short circuit.	02
9	Identify and specify different types of switches used for different applications as per current and voltage ratings.	02
10	Identify and specify different types of sockets and plugs used for different current and voltage ratings.	02
11	Understand the working of various electrical circuit protective devices like fuse, MCB etc.	02
12	Prepare a meter board for lighting and power installation using MCB, energy meter, fuse unit, DP switch, indicators and bus bars.	04
13	Identify and specify different types of resistors and capacitors as per standard color code practice.	04
14	Solder various resistors, capacitors and electronic components on PCB.	08
15	Conduct mock artificial respiration and first aid exercises to learn about safety procedures of first aid in case of electrical hazards.	04
16	Understand the importance of earthing in electrical installations.	02
Total Hours		56

LIST OF REFERENCES:

1. Handbook of Electrical Engineering by Bhatia, S.L. Khanna Publication
2. Electrical engineering drawing i & ii by Singh, Surjit, S.K. Kataria & sons
3. Electrical engineering materials & semiconductor devices by Gupta, J.B. & Gupta, Renu, S.K. Kataria & sons
4. Electrical Engineering Materials by Mithal, G.K., Khanna Publication
5. <http://www.kpsec.freeuk.com/components/switch.htm>
6. <http://home.howstuffworks.com/electrical.htm-tools>