



Semester – I

Subject Name: Electrical Practice

Subject Code: 09EE2102

Diploma Branches in which this subject is offered: Electrical Engineering

Objective: The Electrical workshop practice is a pillar of the real industrial situation which supports to grow and boost relevant technical hand skills required by the technician working in the different engineering fields and workshops. Irrespective of branch the use of workshop performs in day to day industrial as well domestic life helps to soften the problems.

Credits Earned: 2 Credits

Course Outcomes: After learning the course the students should be able:

1. To apply knowledge of electrical safety and fire hazards for prevention of accidents and loss of equipment or human.
2. To use electrical and electronic symbol and color code.
3. To identify and select proper tool as per requirement.
4. To measure key parameters for satisfactory operation and repairing
5. To use proper tools and techniques to prepare wiring diagram as per requirement.

Pre-requisite of course: Basic knowledge of physics.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
0	0	4	2	00	30	20	25	25	100



Contents:

Unit	Topics	Contact Hours	Weightage (%)
1	Electrical Safety <ul style="list-style-type: none">• Introduction• Electric shock and its effects, Precaution to be taken,• After shock treatments, Artificial respiration; First method, Second method, Silvester's method, Eve's rocking method, Modern month-to-mouth respiration method, Artificial resuscitator• Electrical safety and it's classification, Safety Rules• Safety precautions for indoor and outdoor installations• First Aid Practice; Burns, Equipment and First Aid materials, Procedure of initial treatment• Electrical safety tools and protective equipment• Electric fire; Initiation of electric fire, Fires in electrical power plants and substations, Classes of fires and Removal of fire, Prevention of fire and Fire extinguishers• Application of fire extinguishers• Fire safety norms	8	12
2	Electrical Symbol and Abbreviations <ul style="list-style-type: none">• Introduction• Various symbol and abbreviations used in electrical network• Electrical and electronics symbol drawings• Component used in electrical network, color code identification	4	10
3	Tools used for Electrical Work. <ul style="list-style-type: none">• Introduction• Common tools used for electrical work, Specification of the electrical tools, Electrical materials.	6	14



4	Electric Wiring, Material and wiring diagram <ul style="list-style-type: none">• Introduction• Type of wires; Single strand wire, Multi strand wire, Shielded wire, Multi core wire etc.• Type of switches; SPST, SPDT, DPST, DPDT, Two way switch, Multi point switch, Rotary switch, Heavy duty switch, Toggle switch, Push button(NO and NC contact) etc.• Type of fuse; Re-wireble, HRC, Kit-Kat etc.• Types of distribution box; LDB, LDDDB, MDB, HDB, ASB, MLDB, MCB, MCCB etc.• Types of Lamps and it' fixtures & reflectors• Methods of wire laying• Tools used for wiring; Plier, Nose plier, Cutter, Tester, Line tester, Test lamp, Screw driver, Spanners, Hammer etc.• Materials used for wiring; Cable ties, Lag, Glands, cable tray, ferrules, strip connectors, cable tags etc.• Types of connector and joints in wiring• House wiring process and it's type Exercise:<ol style="list-style-type: none">1. Prepare an extension board having 5A, 15A plug-points, fuse and switches2. Connection of various electrical home appliances- Lamp, LED, Tube light, Ceiling fan, Table fan, Mixture, A.C., Refrigerator etc.3. Study of Tube light wiring and it comparison with CFL.4. To make a distribution board for home lighting system- using of Plugs, Switch, Fan regulator, Fuse etc.5. To prepare model of house wiring- using of Energy meter, Fuse, Switch board, Indicator, Different types of load etc.	24	34
5	Electrical parameter and Measuring instruments <ul style="list-style-type: none">• Introduction• Various electrical parameter; Voltage, Current, Frequency, Power, Energy and Speed.• Various measuring instruments; Voltmeter, Ammeter, Multimeter, Wattmeter, Frequency meter, Clip-on-meter, Megger, Energy meter, Earth tester and Tachometer.	6	12
6	General techniques for trouble-shooting and Repairing of electrical Home Appliance and Equipment.	8	16



List of Experiments:

Sr. No.	Unit No.	Name of Topics	Contact Hours
1	1	To understand electric hazards & safety, safety rules and application of electrical personal protective equipments.	2
2	1	To understand concept of electric shock and its effects, precaution, cure, conduct mock artificial respiration and first aid exercise.	2
3	1	Identify various type of fire and application of fire extinguishers.	2
4	2	Identify the different symbols and abbreviations used in electric network.	2
5	2	Use various tools for electric work and colour code for electric wire.	6
6	4	Identify different types of wires; single strand wire, Multi strand wire, Shielded wire, Multi core wire etc. and make wire joints.	2
7	4	Identify different types of switches used for different application as per current and voltage rating; SPST, SPDT, DPST, DPDT, Two way switch, Multi point switch, Rotary switch, Heavy duty switch, Toggle switch, Push button etc. and Distribution board used for electric network; LDB, DCDB, MDB, HDB, ASB, MLDB, MCB, MCCB etc.	4
8	4	Identify different type of sockets and plugs used for different current and voltage rating.	2
9	4	Identify different types of fuse and demonstrate working of fuse.	2
10	4	Use different types of lamps, it's fixtures & reflectors for lightening purpose.	2
11	4	Identify and use materials required for wiring; wire ties, Lag, Glands, wire tray, Ferrules, Strip connectors, etc.	4
12	4	To prepare house wiring diagram and understand different method of wiring.	4
13	4	To understand internal electric wire connection, working and repair different electric home appliances; Lamps, CFL, Fluorescent tubes light and type, LED, Fan and energy saving by fan, Refrigerator, Washing machine, Toaster, LED etc.	10
14	4	To prepare extension board of as per requirement and draw house wiring diagram	2
15	5	To use measuring instrument for measurement electric parameters; voltmeter, Ammeter, Multimeter, Wattmeter, Frequency meter, Clip-on-meter, Megger, Energy meter, Earth tester, Test lamp and Tachometer etc.	6



References:

1. R. P. Singh, "*Electrical Workshop*", I.K. International Publishing House Pvt. Ltd., 2013
2. G. K. Mithal, "*Electrical Engineering Materials*", Khanna Publication, 2011
3. Singh, S. K. Surjit, "*Electrical Engineering Drawing I & II*", Kataria & Sons, 2012
4. S.L. Bhatia, "*Handbook of Electrical Engineering*", Khanna Publication, 2012
5. S. L. Uppal & G. C. Garg, "*Electrical Wiring, Estimating and Costing*", Khanna Publication, 2012

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources:

1. <http://nptel.ac.in/courses/108108076/>
2. <http://nptel.ac.in/downloads/108105053/>
3. <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electronics-spring-2007/video-lectures/>
4. <https://www.facstaff.bucknell.edu/mastascu/eLessonsHTML/EEIndex.html>
5. <http://www.electrical4u.com/nature-of-electricity/>