Semester – I

Subject Name: Electrical Practice

Subject Code: 09EE1102

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 usage of electrical and electronic symbol and color code in practice
3. To identify and select proper tool for given application.
4. To measure key parameters for satisfactory operation and repairing
5. To prepare wiring for given application using proper tools and techniques.

Pre-requisite of course: Basic knowledge of physics i.e. electrical parameters and materials.

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** Introduction(current v/s voltage) Electric shock and its effects Precaution to be taken, if subjected to an electric shock 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 precautions for indoor installations Safety precautions for outdoor installations Standard procedure First Aid Practice • Burns • Equipment and First Aid materials • Procedure of initial treatment Safety Rules 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 • Fire extinguishers	**8**	**12**
2	**Electrical Symbol and Abbreviations** Introduction Various symbol used in electrical engineering Abbreviations commonly used in electrical engineering Drawing of symbols of various electrical and electronics Component used in engineering and color code identification	**4**	**10**
3	**Types and specifications of Tools and Common Electrical Material.** Introduction Common tools used for engineering work Specification of the electrical hand tools, Electrical materials.	**6**	**14**

4	**Electric Wiring and Material used for wiring** 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 etc. Type of fuse • Re-wireble, HRC, Kit-Kat etc. Types of distribution box • LDB, LDDB, MDB, HDB, ASB, MLDB, MCB, MCCB etc. Types of Lamps and it' fixtures & reflectors Methods of wiring laying Tools used for wiring and It's application • Plier, Nose plier, Cutter, Tester, Line tester, Test lamp, Screw driver, Spanners, Hammer etc. Materials used for proper wiring • Cable ties, Lag, Glands, cable tray, ferrules, strip connectors, cable tags etc. Types of connector and joints House wiring process and it's type Exercise: 1. Prepare an extension board having 5A, 15A plug-points, fuse and switches 2. Connection of various electrical home appliances- Lamp, LED, Tube light, Celling 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	**Measurement and instruments** Introduction Various electrical quantities like Voltage, Current, Frequency, Power, Energy, Speed, etc. Various measuring instruments like Voltmeter, Ammeter, Multimeter, Wattmeter, Frequency meter, Clip-on-meter, Megger, Energy meter, Earth tester, Tachometer etc.	**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 study of electric hazards & safety, safety rules and electrical safety tools	2
2	1	To study of electric shock and its effects, precaution, cure, conduct mock artificial respiration and first aid exercise to learn about safety procedures.	2
3	1	Identify various type of fire and fire extinguishes	2
4	2	Identify the different symbols and abbreviations used in electric network	2
5	2	Identify various component and tools used in electrical engineering and colour code for electrical engineering	4
6	4	Identify and specify different types of wires, wire joints used for different current and voltage ratings and its standard. Single strand wire, Multi strand wire, Shielded wire, Multi core wire etc.	2
7	4	Identify and specify different types of switches used for different application as per current and voltage rating, like SPST, SPDT, DPST, DPDT, Two way switch, Multi point switch, Rotary switch, Heavy duty switch, Toggle switch, Push button etc. and Distribution board used in electric network, LDB, DCDB, MDB, HDB, ASB, MLDB, MCB, MCCB etc.	3
8	4	Identify and specify different type of sockets and plugs used for different current and voltage rating	1
9	4	To study different types of fuse and its application	2
10	4	To study the different types of lamps and it's fixtures & reflectors	2

11	4	Identify various tools and materials used for electric work. Plier, Nose plier, Cutter, Tester, Line tester, Test lamp, Screw driver, Spanners, Hammer etc.	2
12	4	To study tools and materials required for domestic wiring. wire ties, Lag, Glands, wire tray, Ferrules, Strip connectors, etc.	4
13	4	To study types of house wiring design and different methods of wiring laying	4
14	4	To study internal electrical connection of various electrical home appliances.	2
15	4	To prepare extension board of different size/capacity and working model of house wiring.	2
16	5	To study of measuring instruments and measure various electric parameters using Voltmeter, Ammeter, Multimeter, Wattmeter, Frequency meter, Clip-on-meter, Megger, Energy meter, Earth tester, Test lamp and Tachometer etc.	6
17	6	To study working of various domestic equipment. Lamps, CFL, Fluorescent tubes light, LED, Fan, Refrigerator, A.C., Washing machine, Toaster, water purifier, etc.	8

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/
6. http://vlab.amrita.edu/index.php