Course Title	Electrical Workshop		
Course Code	EL107		
Course Credit	Lecture	: 00	
	Practical	: 01	
	Tutorial	: 00	
	Total	: 01	

Course Learning Objectives

At the end of this course students will be able to:
- **Develop** knowledge about various lamps
- **Recognize** the various types of switches & electrical machines
- **Operate** the various types measuring instruments to measure various electrical quantities
- **Distinguish** between various types of house wiring schemes.
- **Replicate** simple circuit in PCB.
- **Trace** the problems in simple electronics circuit.
- **Develop** a prototype model in a team.

Detailed Syllabus

Sr. No.	Name of chapter & Details
1.	**Introduction to Electrical Elements:** Symbols and application:- Basic electrical elements (resistance, capacitor, inductors,), Various electrical equipments,instruments,Cables & wires, etc.
2.	**Switches and Relays** Different types of switch (one way switch, two way switch, proximity switch, limit switch, push button, Two Way Center off Switch:, emergency switch, SPDT, DPDT), different type of relays (NO/NC relays).
3.	**House wiring techniques** Different type of house wiring techniques: casings andcapings, Lead Sheathed Wiring, Conduit Wiring Methods of wiring: Looping-in system, Tree system, Ring system, House wiring tools and electrical materials.
4.	**Measurement of various electrical parameters.** a.c and d.c current &voltage measurement usingVoltmeter, ammeter, multimeter, galvanometer and clamp-on meter. Measurement of a.c. power: Wattmeter, measurement of resistance by Ohm-meter, Multi-meter and Megger. Measurement

	of temperature, capacitance, and hFE parameters of transistor using Multi-meter. Measurement of intensity of light: Lux meter, Measurement of rpm using Tacho-meter.
5.	**Introduction to electrical machines** Demonstration of: a.c and d.c motors and generators. Single phase, Three phase and Variac.
6.	**Introduction to various lamp:** Demonstration and circuit connection of fluorescent lamp, CFL (Compact fluorescent lamp), Sodium vapour lamp, Halogen lamp, mercury vapour lamp, and LED lamp.
6.	**Introduction to electronics equipments:** Power supply(DC regulated), CRO, DSO, Breadboards, soldering iron and Function generators.
7.	**Basic electronics components** Different types of diodes, LEDs, transistors and their applications.
8.	**PCB Design:** Types of PCB, Breadboard, drafting of PCB using various methods, manually or using various design tools.
09	Mini Project: A prototype model in a team on relevant knowledge of electrical workshop

Instructional Method and Pedagogy:

- Laboratories will be conducted with the aid of multi-media projector, black board, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Surprise tests/Quizzes/Seminar/ will be conducted.

Reference Books:

1. S. L. Uppal, Jain Book Depot "Electrical Wiring Estimation and Costing" 6th Edition. ISBN no.9788174092403.Khanna book publishing Pvt Ltd.
2. OSCAD "An open source EDA tool for circuit design, simulation, analysis and PCB design." Shroff Publishers and distributer limited,ISBN-13:978-93-5110-150-5, First edition,2013.
3. Ray C. Mullin "Electric Wiring Residential",ISBN-13: 978-1-4180-5095-5, Sixteenth edition,2008.
4. Electrical costing, estimating and contracting. By S.K. Bhattacharya - TTTI, Chandigarh
5. Max B. Fajardo Jr. , Leo R. Fajardo "Electrical Layout and Estimate" 2nd Edition ,2000

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Additional Resources

http://energy.ece.illinois.edu/balog/images/PCB%20Basics.pdf
https://www.jlab.org/accel/eecad/manuals/PCB.pdf

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Sr. No	Aim of experiment
1	To demonstrate the various tools used in electrical engineering.
2	To demonstrate the various switches and their applications.
3	To demonstrate the use of various electrical measuring instruments.
4	To demonstrate the applications of ELCB, MCB and fuses.
5	To explain various electrical machines and their applications - Control panel: Variable a.c&d.c supply panel - Transformer: Demonstration of Single phase, three phase and Variac. - Demonstration of use ofa.c&d.c: motor and generator.
6	To demonstrate various electrical lamp circuit ;Sodium high pressure vapour lamp ,Helogen lamp, Mercury vapour lamp, tungsten lamp ,compact flourencent lamp & neon lamp.
7	To identify the various electronics components and their respective functions.
8	To operate Multi-meter, Function Generator, CRO and DSO.
9	To implement basic circuit (example:-Rectifier) using breadboard and general purpose PCB.
10	To design special purpose PCB for power supply circuit (manually).
11	To identify various ports and connectors.
12	To identify faults and troubleshoot in electronics circuits.
13	To design wiring for given plan of building.
14	To develop a prototype model which required knowledge of electrical workshop.