SHIVAJI UNIVERSITY KOLHAPUR

CENTER FOR COMMUNITY DEVLOPMENT

CERTIFICATE COURSE IN ELECTRICAL (Credit -12)

1	**Name of Syllabus**	Certificate course in **Electrical**
2	**Duration**	1 year
3	**Expected number of students**	30
4	**Course fees per student**	Course Fees Rs.2500/- + Evaluation Rs250
5	**Medium of instruction**	English and Marathi
6	**Eligibility**	10^{th} pass or equivalent
7	**Required infrastructure**	1. Class-room with 20 benches, and all other accessories. 2. Electrical Laboratory, wiring boards, Industrial type MG. set is essential for training. 3. Collaboration with A type industrial and domestic contractor, foundries having electrical furnaces, textile industries, sugar factories/dairy plant/electric equipment manufacturer is essential
8.	**Subject**	Paper I - Basic electricity Paper II- Domestic & industrial electrical wiring Paper=III Advance electrical
9	**Evaluation**	Theory 300 marks Practical 100 marks Internal 100 marks Grand Total 500 marks
10	**Objective**	1. To provide knowledge of domestic and industrial wiring 2. To frame the standards for operation and maintenance of electrical equipment and machinery 3. To train the students to use common workshop to and its applicators.
11	**Skill to be provided**	'his course also aims of to make simple calculations for estimations required for the following purpose. a. Domestic and industrial wiring. b. Selection of Electrical wiring material, accessories and fuse. c. Earthing material.
12	**Employment opportunities**	a. Job as Wireman and electrician. b. Assistant to building contractor for electrification. c. Student can set up electrical shop

Title Of Paper	Credit	Theory	Practical	Internal	Total
Basic Electrical	4	100	30	-	130
Domestic Electrical Wiring Industrial Electrical Wiring	4	100	30	-	130
Advance Electrical	4	100	30 + 10 Oral	-	140
Grand Total of Marks	12	300	100	100	500

1) **Theory Exam – Totally objective**
2) **Practical Exam- Actual Demo. Identification, Oral**
3) **Internal Exam- Attendances, Class performance, Project, field visits,**

Subject Name: - Basic Electricity

<table>
<tr><td rowspan="2">Course Code :</td><td>Basic Electricity Semester</td><td>Credit : 4</td><td>Marks</td></tr>
<tr><td>Total hours of teaching with practical 120</td><td>internal 50</td><td>External 50</td></tr>
<tr><td>Course Outcomes :</td><td colspan="3">understand fundamental electrical concepts, apply relevant laws and theorems to analyse simple circuits, and comprehend the principles of electromagnetic induction</td></tr>
<tr><td>Unit No.</td><td colspan="2">Description</td><td>No. Of Periods</td></tr>
<tr><td>1</td><td colspan="2">(1) Current Electricity, Introduction to electricity, Potential difference. Current resistance factors, factors on which resistance depends, temperature coefficient of resistance Direct and alternating current. AC and D.C. Power and Energy symbols. and IE rules
(2) D. C. Circuits: Ohm's law. Resistance in parallel and series and its examples.
(3) Electromagnetic Effects. Permanent magnet, electro magnet, Faraday's law of electromagnetic induction dynamically statically induced EMF: Self and mutual Inductance. Energy stored in magnetic field Force on Current carrying conductor placed in magnetic field
(4) Single Phase AC Circuits Generation of alternating voltage and current production and sinusoidal wave form, series R-L circuit. Series R-C circle, Series R-L-C circuit Simple parallel circuit. Pl of electricity, Power factor improvement</td><td>Th-10
Pr-20</td></tr>
<tr><td>2</td><td colspan="2">A. Safety precautions and elementary first aid treatment in case of accidents such as electrical shocks and burns
B. Study of parallel resistive circuits
C. Study of R-L-C circuit and Measurement of power
D. Study of series resistive circuits.
E. Study of lead acid and nickel iron cells
F. To find heat efficiency of electric kettle</td><td>Th-10
Pr-20</td></tr>
<tr><td>3</td><td colspan="2">Secondary Cells: Introduction to types of cells. Method of charging, care and maintenance of cells.
Healing and lightening effects: Joules law of electrical heating. Heating efficiency Domestic Applications, lightening effects
Study of different measuring instruments such as ammeter.
Voltmeter Wattmeter. Energy meter. C.T. and PT. Introduction of digital instruments</td><td>Th-10
Pr-20</td></tr>
<tr><td>4</td><td colspan="2">Verification of Ohm's law, Measurement of resistance by ammeter voltmeter method and Ohm meter method, Dismantling and reassembling old Dynamo
Industrial Visits, Drawing symbols of electrical accessories</td><td>Th-10
Pr-20</td></tr>
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Subject Name: - Domestic and industrial Electrical wiring

Course Code	Domestic and industrial Electrical wiring	Credit : 4	Marks : 100
	Total hours of teaching with practical 120	internal 50	External 50
Course Outcomes :	Students will be able to understand and apply electrical codes, select appropriate wiring materials, and install various electrical components, including circuit breakers, switches, and outlets. They will also be able to troubleshoot and repair electrical problems, ensuring safe and efficient electrical systems		

Unit No.	Description	No. Of Periods
1	Safely precautions and elementary first aid treatment in case of accidents such as electrical shocks and burns. Introduction to common Hand tools used by an electrician such as steel rule. pliers, cutters, screw drivers, carpentry tools such as planers, hammers, marking and holding fools, Fitter's tools such as hack saw, laps, drills, dies and their different types, hand vice and pipe vice. Conductors and Insulators, different sizes of wires, Use of SWG, work power Energy and their units. Testing of supply use of test lamp Study of common electrical accessories and materials, used as cut-outs, switches, ceiling rose, lamp holders, wall sockets, adapters, round blocks, various types screws, their sizes, boards, PVC casing, capping and its accessories such as bends, coupling, elbows, tee, Importance of fuse for the circuits, types of fuses. Basic information regarding MCB and ELCB.	**Th-10** **Pr-20**
2	1. To make trainees familiar with a) Electrician tools, b) Carpenter's tools, c) Fitter's tools 2. Study of different wiring accessories. 3. Fixing of switches, sockets on boards. 4. Study of different types of wires used in domestic wiring. 5. Study of various types of wires used in domestic wiring. 6. Study of series and parallel circuits. 7. One lamp control from one point in electrical wiring. 8. Fitting of ceiling fan with regulator, Fitting and connecting tube lights and exhaust fan, dismantling of ceiling, table and exhaust fan. (Ceiling fastener), Over-oiling.	**Th-10** **Pr-20**
3	Diagram and wiring layout for simple connections. Wiring of clear PVC casing, capping. Connections of tube light, discharge lamps, connection diagram for distribution and fuse boards of supply circuits. Lighting and heating points and their control. The installation of electric bells, Energy meter installation, Methods of earthling and each connections, method of soldering. Dismantling of domestic mixers, changing brushes, bushes, changing coil in electrical iron. Use of earth megger for earth resistance testing.	**Th-10** **Pr-20**
4	Lt Wiring: Up to 415 V, control panel, DOL/Star/Delta. Rotor, resistor, starter and interlocking wiring, Bus bar, ICTP switches up to 200 A. protection fuses, MCCB, ELCB, Cable termination, Distribution, different sections, cable sizes, cable laying Cable join up to the load point. Accessories used for power wiring distribution boxes, connection cable for wiring 7/20, 1/18, testing maintenance, fault finding of cable.	**Th-10** **Pr-20**

practical	Dismantling of domestic mixers, changing brushes, bushes, changing coil in electrical iron. Use of earth megger for earth resistance testing. Control of two lamps from two points in PVC casing capping. Control of one lamp from two points in PVC casing capping. Practice of joints. 'T' bends, corners etc. Study of ammeter. Voltmeter, Wattmeter. Energy meter. **Industrial Visits:** Visits to MSEB substations. H. T. consumer.	

Subject Name: Advance Electrical

Course Code	Advance Electrical	Credit : 4	Marks :
	Total hours of teaching with practical 120	internal 50	External 50
Course Outcomes :	Understanding complex electrical systems, troubleshooting, and utilizing advanced tools and techniques. These courses often focus on areas like power systems, automation, and safety, preparing graduates for roles like Electrical Technicians, Supervisors, and Maintenance Engineers		
Unit No.	Description		No. Of Periods
1.Electric appliances	1) Study of electrical Appliances. 2) Study the spare parts of electrical appliances.		**Th-10** **Pr-20**
2. LED Lamps	Study the spare parts in LED bulb, Tube light. Basic electronics. Halogen		**Th-10** **Pr-20**
3. Electric appliances	1. Changing power cord, changing coil & inductor in water heater. 2. Dismantling of geyser study & replace thermostat rod, element etc. Study & replace coil and power cord in toaster , oven hair dryer		**Th-10** **Pr-20**
4.Solar	Solar electricity , need of solar energy, solar photovoltaic technology & advantages of SPV system solar constant, formation of solar cells, SPV module, array & application of solar photovoltaic system		**Th-10** **Pr-20**
Practical.	1) Study of Induction cooker. 2) Dismantling of Induction cooker & How to check spares in Induction cooker. 3) Dismantling of Electrical Kettle, Changing Thermostat Power cord changing coil in kettle, test resistance of coil on multi metre. Assembling of Led bulbs. 4) Repairing of Led bulbs, tube lights LED panel's, halogen etc. 1. Solar system awareness.2. Installation of solar system Commissioning of solar system		

Books to be refer:

1. Electrical Appliances M.L. Anwani
2. Electrical Technology H.Cotton
3. Fundamentals of electrical technology V.K.Mehta
4. Electrical engineering M.L.Gupta
5. Electrical Technology B.L.Thoraja
6. Electrical Technology Bhatnagar
7. Basic Electrical Engineering Sharma