



Department of Physics

UG III Semester

Paper-Vocational

ELECTRICAL TECHNOLOGY (MODULE 1)

Course Outcomes

CO. No.	Course Outcomes	Cognitive Level
CO 1	To understand maintenance of electrical equipment	U, R
CO 2	Able to safe himself from any electrical shock	Ap, E
CO 3	Able to work in Service centre to repair latest useful domestic and office use equipment	An,Ap,C

Credit and Marking Scheme

	Credits	Marks		Total Marks
		Internal	External	
Theory	2	40	60	100
Practical	2	40	60	100
Total	4		200	





Content of the Course

Theory

No. of Lectures (in hours per week): 2.2 Hrs. per week

Total No. of Lectures: 30 Hrs.

Maximum Marks: 60

Unit	Topic	Lectures
I	<p>1 Current Electricity:</p> <p>Electricity as a source of energy, definition of resistance, voltage, current power, Energy and their units, relation between electrical, mechanical and thermal</p> <p>units, factors affecting resistance of a conductor, temperature co-efficient of resistance, principle of thermostat, difference between AC and DC voltage and current</p> <p>1. D.C Circuits :</p> <p>Ohm's Law, series- parallel resistance circuits, calculation of equivalent resistance, Kirchoff's Laws and their applications.</p> <p>2. Electric Cells:</p> <p>Primary cell, wet cell, dry cell, batteries , series and parallel connections of cells, secondary cells, Lead acid cell, Discharging and . recharging of cells, common charging methods preparation of electrolyte, care and maintenance of secondary cells.</p> <p>3. Heating and Lighting Effects of Current :</p> <p>Joule's Law of electric heating and its domestic applications, heating efficiency, lighting effect of electric current, filaments used in lamps, and gaseous discharge lamps, their working and applications.</p> <p>4. Capacitor :</p>	15





	<p>Capacitor and its capacity, concept of charging and discharging of capacitors, types of capacitors and their use in circuits series and parallel connection of capacitors, Energy stored in a capacitor.</p>	
II	<p>1. Electromagnetic Effects</p> <p>Permanent magnets and electromagnets, their construction and use, polarities of an electromagnet and rules of finding them Faraday's Law of Electromagnetic induction, dynamically induced e.m.f, its magnitude and induction, Static induction, self-induced e.m.f, its magnitude and direction, inductance and its unit, mutually induced e.m.f, its magnitude and direction, Energy stored in an inductance.</p> <p>Force acting on a current carrying conductor in magnetic field, its magnitude and direction, torque produced on a current carrying coil in magnetic field, principles and construction of dynamo. A.C and D.C motor, construction and working of single phase motor, principle of transformer and its type.</p> <p>2. A.C Circuits</p> <p>Generation of A.C voltage, its generation and wave shape. Cycle, frequency, peak value (maximum value), average value, instantaneous value, R.M.S value form factor, crest factor, phase, phase difference, power and power factor, A.C Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R.L.C series circuits</p>	





References

Test/Reference Books:

1. Tata M.CGraw Hill,2004 ,Electc circuits, Schaum'soutline series ,.Nasar S.A
2. Nahvi M. and Edminister J., Electrical Circuits, Schaum's Outline Series, Tata McGraw Hill 2005.
3. Chakrabarti A., Circuit theory, Dhanpat Rai & Co.
4. Tharaja **B.L.**, A Textbook of Electrical Technology volume 1. S Chand and Company New Delhi, 2005.
5. Mehta V.K, Mehta Rohit, Principle of Electrical Engineering. S Chand and Company New Delhi, 2005.
6. Gupta J.B,Text book of Electrical Technology, SK Kalaria and sons, 2012.
7. Kulshreshtra D.C, Basic Electrical Engineering, McGraw Hill first edition.

Web Links:

1, National Digital Library —<https://ndl.iitkgp.ac.in/>
Lectures - <https://ocw.mit.edu/index.htm>

2. Video:<http://www.youtube.com.c.mitcw.search/query=circuit/020theory>





ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A+' Grade by NAAC(CGPA:3.68/4.00)

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List of Practical

1. Manufacturing of series lighting
2. Study about safety measure and tools
3. Fan repairing and its study
4. Mixer repairing and its study
5. Geezer repairing and its study
6. Cooler repairing and its study
7. Invertor repairing and its study
8. Electrical iron repairing and its study
9. Electric kettle repairing and its study
10. Induction cooker repairing and its study
11. Water purifier repairing and its study
12. Solar panel maintenance - Basic knowledge
13. Study of MCB, ELCB
14. To find out unknown resistance
15. Soldering of wire by using soldering rod.
16. To detect and fix the problem in Doorbell.
17. To detect and fix the problem in Blender.
18. To understand the working and fix the problem in Regulator.
19. To detect and fix the problem in Mosquito Racquet.
20. To learn the working of Heater and how to construct it.
21. To detect and fix the problem in Hair Dryer
22. To detect and fix the problem in Heater blower

