GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Electronics and communication Department

Academic Year: 2016-17
Semester : Even

6. COURSE PLAN

Semester: II Subject Code: 15ELE25/CSE/CIVIL Subject Name: Basic Electrical Engineering Name of Subject Teacher: Sudha Rani J

Name of Subject Expert (Reviewer): Kavitha M V

For the Period: From: 06-08-16 to 02-06-16

Details of Book to be referred:

Text Books	**T1:** Basic Electrical Engineering, D. C. Kulshreshtha, 1st Edition,Revised
Reference Books	**R1**: Fundamentals of Electrical, Engineering, Rajendra Prasad PHI Third Edition 2014 **R2:** Basic Electrical Engineering AbhijitChakrabarti, Chandan Kumar Chanda, Sudiptanath

Lecture No	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD	Remarks by Principal
1	Introduction to the subject			6/2/2017	6/2/2017	Nil			
2	**Module.1**: DC Circuits and Electromagnetism Ohm's Law analysis of series, parallel circuits excited by independent voltage sources	**Objectives**: • Define fundamental electric and magnetic properties. 2.Comprehend the fund mental laws of electric circuits- ohm's Law and Kirchhoff's laws • Analyze dc series, parallel and series-parallel circuits. • Design simple circuits for specified power and energy requirements. • Distinguish between statistically and dynamically induced emf. • Apply Faraday's law and lenz's law in magnetic circuits. • Distinguish between statistically and dynamically induced	T1: 2.3	6/2/2017	6/2/2017	Nil			
3	Kirchhoff's Laws		T1: 2.22	7/2/2017	7/2/2017	Nil			
4	Power and Energy.		T1:2.15	8/2/2017	8/2/2017	Nil			
5	Illustrative examples on KVL & KCL		Question Paper	9/2/2017	9/2/2017	Nil			
6	Illustrative examples on KVL & KCL		Question Paper	10/2/2017	10/2/2017	Nil			
7	Illustrative examples on KVL & KCL		Question Paper	10/2/2017	10/02/17	Nil			
8	Electromagnetism: Review of field around a conductor, coil. Magnetic flux and flux density, magnetomotive force and magnetic field intensity, reluctance and permeability,		T1:3.1	13/02/17	13/02/17	Nil			
9	definition of magnetic circuit and basic analogy		T1:3.2	13/02/17	13/02/17	Nil			

10	Electromagnetic induction : Definition of Electromagnetic Induction, Faradays Laws, Fleming's right hand rule, Lenz's Law	emf. • Apply Faraday's law and lenz's law in magnetic circuits. **Applications:** **DC circuits:** Domestic, Automotive, Telecommunication, High-voltage power transmissions etc **Electromagnetism**: Household appliances, Industrial Applications, Magnetic Levitation Trains, Communication Systems, Medical Systems etc **Outcome:** Student will Know fundamental electric and magnetic properties. Be able to apply KVL and KCL for several circuits	T1:3.5	14/02/17	14/02/17	Nil			
11	Statically and dynamically induced emf. Concept of self-inductance		T1:3.6	15/02/17	15/02/17	Nil			
12	Concept of mutual inductance		T1:3.15	16/02/17					
13	Force on current carrying conductor placed in a magnetic field, Fleming's left hand rule		T1:3.8	17/02/17					
14	Co-efficient of coupling. Energy stored in magnetic field.		T1:3.16, 3.18	20/02/17					
15	Illustrative examples		Question Paper	21/02/17					
16	Illustrative examples		Question Paper	22/02/17					
17	Illustrative examples		Question Paper	23/02/17					
18	**Module 2: D.C.Machines :** Working principle of D.C. Machine as a generator and a motor	**Objectives:** • Understand the working of D.C. Machine as a generator and a motor. • Analyze and	T1:9.1	27/02/17					

19	Types and constructional features. Types of armature windings	understand constructional features. Types of armature windings • Draw phasor diagrams for balanced three-phase star delta systems. • Derive expression for Emf equation of generator, relation between induced emf and terminal voltage with an enumeration of brush contact drop. **Applications:** • DC motor is used in several industrial and domestic appliances • The concept of DC generator is used for generation of electrical DC power Outcome: • Understand Principle of operation of dynamometer type wattmeter • Understand the working of D.C. Machine as a generator	T1:9.8	28/02/17					
20	Emf equation of generator, relation between induced emf and terminal voltage with an enumeration of brush contact drop and drop due to armature reaction		T1:9.13	1/3/2017					
21	Illustrative examples		T1:9.14	2/3/2017					
22	Operation of D.C. motor,		T1:9.21	3/3/2017					
23	Types of D.C. motors, characteristics and applications.		T1:9.26	3/3/2017					
24	Necessity of a starter for D.C. motor.		T1:9.29	4/3/2017					
25	Illustrative examples on back emf and torque.		T1:9.28	6/3/2017					
26	Illustrative examples on back emf and torque.		T1:9.29	7/3/2017					
27	Illustrative examples on back emf and torque.		T1:9.31	8/3/2017					

28	**Measuring Instruments:** Introduction Construction and Principle of operation of dynamometer type wattmeter	and a motor. • Know the necessity of a starter for a DC Motor.	T1:7.8	13/03/17					
29	Construction and Principle of operation of single phase induction type energy meter.		T1:7.12	14/03/17					
30	Unit Test 1			15/03/17					
32	definition and numerical values of average value, root mean square value, form factor and peak factor of sinusoidally varying voltage and current		T1:4.9	17/03/17					
33	Phasor representation of alternating quantities.		T1:4.14	17/03/17					
34	Analysis, with phasor diagrams of R, L, C circuits		T1:4.25	20/03/17					
35	Analysis with R-L, R-C and R-L-C circuits		T1:5.5	21/03/17					
36	Analysis of series, parallel and series-parallel circuits		T1:5.7	22/03/17					
37	Real power, reactive		T1:5.9	23/03/17					

	power, apparent power and power factor								
38	Illustrative examples		T1:5.11	24/03/17					
39	Illustrative examples		T1:5.12	24/03/17					
42	Domestic Wiring: Service mains, meter board and distribution board.		T1:8.2	27/03/17					
43	Brief discussion on concealed conduit wiring. Two3way and three-way control.		T1:8.5	28/03/17					
44	Elementary discussion on Circuit protective devices: fuse and Miniature Circuit Breaker Electric shock, precautions against shock – Earthling, Earth leakage circuit breaker		T1:8.12	30/03/17					
45	Residual current circuit Breaker (RCCB).		T1:8.6	31/3/17					
46	**Module .4Three Phase Circuits** Necessity and advantages of three phase systems	**Objectives:** • Understand the working of three phase power system. • Analyze three phase ac generator. Draw phasor diagrams for balanced three-phase star delta systems. • Derive expression for	T1:6.1	31/3/17					
47	Generation of three phase power		T1:6.6	03/0417					
48	Definition of Phase sequence, balanced supply and balanced load.		T1:6.5	4/4/2017					

49	Relationship between line and phase values of balanced star connection.	three-phase power. **Applications:** Power consumed measurement, 3phase systems are used in large power consuming industries **Outcome:** • Analyze three phase ac generator. Draw phasor diagrams for balanced three-phase star delta systems • Implement two wattmeter method for power measurement. • Choose equipment of proper rating for a given application.	T1:6.7	5/4/2017					
50	Relationship between line and phase values of balanced delta connection.		T1:6.10	6/4/2017					
51	Power in balanced three phase circuits,		T1:6.15	7/4/2017					
52	Measurement of power by two-wattmeter method		T1:6.17	7/4/2017					
53	Determination power factor using wattmeter readings.		T1:6.21	10/4/2017					
54	Illustrative examples		T1:6.22	11/4/2017					
55	Illustrative examples		T1:6.23	12/4/2017					
56	**Synchronous generators:** Principle of operation, Types and constructional features		T1:11.3	13/04/17					
57	Advantages of rotating field type alternator, Synchronous speed,		T1:11.2	20/04/17					
58	Frequency of generated voltage, Emf equation. Concept of winding factor.		T1:11.14	21/04/17					
59	Illustrative examples on emf equation.		T1:11.15	21/04/17					
60	Illustrative examples on emf equation.		T1:11.17	2/5/2017					

61	**Unit Test 2**			3/5/2017					
62	**Module.5: Single Phase Transformers:** Necessity of transformer, Principle of operation and	**Objectives:** • Understand the need of a transformer. • Understand the working of transformer. • Derive the emf Equation of 1 phase transformer. • Analyze the Condition for maximum efficiency, Voltage regulation and its Significance. • A brief knowledge on Three Phase Induction Motors, its working principle. • Applications of squirrel - cage and slip – ring motors. **Applications:** Transformers are used in all electrical systems, and equipments used in day today life to step up and step down the voltage **outcomes:** After the completion of the topic, the student will be able to predict the behavior of electrical and magnetic circuits realize the	T1:10.4	4/5/2017					
63	Construction of single-phase transformers (core and shell types)		T1:10.14	5/5/2017					
64	Emf equation, losses, variation losses with respect to load, efficiency		T1:10.5	5/5/2017					
65	Condition for maximum efficiency, Voltage regulation and its Significance		T1:10.21	8/5/2017					
66	Illustrative problems on emf equation and efficiency only.		T1:10.23	9/5/2017					
67	**Three Phase Induction Motors** :Principle of operation, Concept and		T1:12.5	10/5/2017					
68	production of rotating magnetic field Synchronous speed, rotor speed, Slip,Types and Constructional features		T1:12.7	11/5/2017					
69	Frequency of the rotor induced emf, Slip and its significance.		T1:12.8	12/5/2017					

70	Applications of squirrel - cage and slip - ring	requirement of transformers in transmission and distribution of electric power and other applications	T1:12.8	12/5/2017					
71	Motors. Necessity of a starter, starting of motor using stars-delta starter.		T1:12.10	18/05/17					
72	Illustrative Examples		T1:12.11	19/05/17					
73	**Unit Test 3**			19/05/17					
74	**Revision and QP solving**			22/05/17					
75	**Revision and QP solving**			22/05/17					
76	**Revision and QP solving**			23/05/17					
77	**Revision and QP solving**			24/05/17					
78	**Revision and QP solving**			25/05/17					

Prepared By: Sudha Rani J

Date & Sign_____

Reviewed by: Kavitha M V

Date & Sign_____

Approved by: Kavitha M V

Date & Sign _____