

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, 1 st Edition, Revised
Reference Books	<p>R1: Fundamentals of Electrical, Engineering, Rajendra Prasad PHI Third Edition 2014</p> <p>R2: Basic Electrical Engineering Abhijit Chakrabarti, Chandan Kumar Chanda, Sudiptanath</p>

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: <ul style="list-style-type: none"> Define fundamental electric and magnetic properties. 2.Comprehend the fundamental 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.	T1:3.5	14/02/17	14/02/17	Nil			
11	Statically and dynamically induced emf. Concept of self-inductance	Applications: DC circuits: Domestic, Automotive, Telecommunication, High-voltage power transmissions etc	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	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	T1:3.8	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	<p>understand constructional features. Types of armature windings</p> <ul style="list-style-type: none"> • 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. <p>Applications:</p> <ul style="list-style-type: none"> • DC motor is used in several industrial and domestic appliances • The concept of DC generator is used for generation of electrical DC power <p>Outcome:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> 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.	<p>three-phase power.</p> <p>Applications:</p> <p>Power consumed measurement, 3phase systems are used in large power consuming industries</p> <p>Outcome:</p> <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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

Reviewed by: Kavitha M V

Approved by: Kavitha M V

Date & Sign _____

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Date & Sign _____

