

BE V SEMESTER						
COURSE CONTENTS						
EE-5001	Electrical Machine-II	L	T	P	Max. Marks	Min. Marks
Duration in hrs.		3	1	2	70	22

UNIT – I :Polyphase induction motor:

concept of rotating magnetic field produced from a polyphase system, calculation of its magnitude and velocity (angular), principle of action of a polyphase induction motor. Types of motors, slipring and squirrel cage.

Nature of torque production and derivation of torque equation. Synchronous speed, synchronous speed. Vector diagram of unloaded and loaded motor. Development of equivalent circuit of an induction motor. Induction motor as a generalized transformer. Relation between copper loss, power output and torque. Condition for maximum torque and power. Torque slip characteristics, starting torque, relation between starting torque, maximum torque and full load torque.

UNIT – II :Testing & starting of 3 phase induction motor:

No load and blocked rotor test for the determination of equivalent circuit parameters of the motor. Construction of circle diagram from results of these tests. prediction of motor performance from the circle diagram. Experimental determination of windage and friction losses and resistance of squirrel cage rotor, equivalent resistance and reactance.

Effect of saturation, change in voltage and frequency as the performance of motor. Effect of harmonics, Cogging. Crawling & magnetic pull (unbalanced in induction motor. Methods of starting induction motors. High starting torque motors – double squirrel cage and deep bar rotors. Induction generator, single phasing of induction motors.

UNIT – III : Synchronous machine:

Basic principle of operation, principal parts and their construction – Types, salient pole and cylindrical or round rotor machines effect of full pitch, short pitch (chorded) coils, and of distributing the winding on the e.m.f. generated. Chording and distribution factor, effect of harmonics in e.m.f. generated. Methods of suppressing harmonic contents. Armature reaction concept of armature reaction, vector diagram for non-salient pole machine, synchronous impedance, and armature leakage reactance. Regulation-signification definition, different methods of obtaining alternator regulation merits and demerits,

UNIT – IV : Analysis of non salient pole synchronous machines:

Two reaction theory. Concept of direct and quadrature axis reactance's (X_d & X_q) analysis of phasor diagram of salient pole synchronous machine. Synchronizing torque and power synchronous motor- principle of operation. Vector diagram for salient and non-salient pole machines. Equation for torque and power developed torque angle, power angle characteristic, stability, stiffness of coupling, synchronizing power and torque. Operation of synchronous motor with fix and variable excitations V curves circle diagram of synchronous motor, performance calculation, experimental determination of v-curves. Methods of starting synchronous motor, Hunting use of dampers, super synchronous motors, synchronous induction motors.

UNIT – V :

Speed and p.f. control of induction motor by injected e.m.f. Basic principle of operation. Development of an equivalent circuit and vector diagram with e.m.f. injected in to the rotor. Dependence of speed & p.f. on magnitude and phase angle of injected voltage. Synchronous condenser, induction regulator, linear induction and synchronous machines.

BE V SEMESTER						
COURSE CONTENTS						
EE-5004	Network Analysis & Synthesis	L	T	P	Max. Marks	Min. Marks
Duration in hrs.		3	1	2	70	22

UNIT – I : Graph Theory:

Graph of network, terminology used in network graph, incidence matrix, tie – set matrix and cut set matrix, formulation of equilibrium equations on loop and node basis.

UNIT – II : Network functions:

Concept of complex frequency, network functions, poles and zeros, restrictions on the location of poles and zeros of driving point function and transfer functions, time domain behaviour from pole – zero plot.

UNIT – III : Two port network

Two port parameters, relationship between parameter sets, interconnection of two – port network, condition of reciprocity and symmetry.

UNIT – IV : Synthesis of passive network:

Synthesis of network with two kinds of elements – LC admittance function, RL and RC impedance or admittance function, positive real function, Hurwitz polynomial Foster and Cauer form.

UNIT – V : Filters:

Filter fundamentals, active and passive filter, analysis of prototype low pass, high pass and band pass filters, m-derived filters, comparison between m – derived and prototype filters.

References-

1. M.E. Van Valkenburg, (PHI) - Network Analysis.
2. F.F.Kuo - Network Analysis.
3. Mittal GK, Khanna Publisher - Network Analysis.
4. Roy Choudhary D - Network and systems.
5. William D Stanley - Network Analysis with Applications
6. Chakraborti - Circuit theory:

COURSE OUTCOMES: At the end of the course student will be able to:

CO1	Solve circuits using tree, cutset and tie set methods.
CO2	Understand & formulate the network transfer function in S-domain and pole- zero concept.
CO3	Evaluate two port network parameters.
CO4	Synthesize one port network using Foster and Cauer forms.
CO5	Understand, analyze and design prototype L-C filters.

BE V SEMESTER						
COURSE CONTENTS						
EE5303	Power System-II	L	T	P	Max. Marks	Min. Marks
EE-5006		3	1	2	70	22
Duration in hrs.						

UNIT – I : Concept of distributed generations:

General consideration on various sources of energy, energy conversion employing steam, energy conversion using water gas turbine, Gas power station, Block diagram, gas cycle, combined cycle power plants, comparison between these power stations:

a) MHD generation b) Solar generation c) Wind power station d) Geothermal power generation.

UNIT – II : Thermal, nuclear and hydro power station:

Block diagram of thermal power station, selection of site. Different types of auxiliaries used in thermal power station. Nuclear Power Station: Different types of reactors and fuels, safety methods, waste disposal. Choice of site, block diagram including surge tank and penstock, Hydrographs, flow duration curve. Types of turbines, base load and peak load power station.

UNIT – III : Economic aspects of power plant operations:

Definitions load factor, demand factor and Diversity factor. Calculation of cost of generation, fixed charges, interest and depreciations, Methods of Depreciation. Tariffs: Different types of tariffs, power factor improvement.

UNIT – IV : Economic Scheduling of Power Stations:

Economic operation of power system, criteria of loading of power plants with and without transmission loss, load dispatching in power system, co-generation and coordination of power plants.

UNIT –V : Power flow analysis:

Requirement of load flow studies, classification of buses, static load flow equation, solution of load flow equation using N-R, GS & FDLF methods and their comparison.

References-

1. G.R.Nagpal, Khanna Publisher - Power Plant Engineering,
2. M.V.Deshpandey - Modern Design of Power Station.

COURSE OUTCOMES: At the end of the course student will be able to:

CO1	Discuss power generation from MHD, solar, wind and geothermal power plants.
CO2	Describe the main components of power system plants and understand their functionalities.
CO3	Learn the economic aspects of power generation like load curve, demand, diversity and plant utilization factors etc. and describe how mathematical optimization techniques can be applied to the economic operation of power systems.
CO4	Solve the problems related to the economic dispatch of power, plant scheduling, unit commitment and formulate strategies to minimize transmission line losses and penalties imbibed.
CO5	Perform steady state power flow analysis of power system networks using Gauss-Seidel, Newton-Raphson and Fast decoupled iterative methods.

EE-5304

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BE V SEMESTER						
COURSE CONTENTS						
EE-5204	Analog and Digital Communication	L	T	P	Max. Marks	Min. Marks
Duration in hrs.		3	0	2	70	22

UNIT – I :

Fourier series, Fourier Transform and its properties, Probability, random variables & their moments, their significance, convolution, auto correlation, cross Correlation & power spectral density, Gaussian & Rayleigh probability density Function, mean, variance & standard deviation, central limit theorem, voltage & Power decibel scales. Signal Processing : Types of signal, deterministic & random, periodic & non Periodic, analog & discrete, energy & power signals, Representation of sinusoid in different forms & their conversion

UNIT – II :

Need of modulation in a communication system, block schematic of a typical Communication system. AM modulation system, modulation index, generation & detection of AM wave, side bands & power content in an AM wave, DSB-SC, SSB, their methods of generation & detection, vestigial side Band modulation, AM transmitter block diagram, comparison of various AM system, modulation & demodulation circuits. Relationship between phase & freq. modulation, FM wave & its spectrum, phasor diagram of a narrow band FM signal, wide band FM, methods of generation & detection of FM, discriminators, pre-emphasis & de-emphasis, Stereophonic FM broadcasting, FM transmitters.

UNIT – III :

TRF receiver & its limitations, necessity of heterodyning, super heterodyning Receivers, IF amplifiers, selection of intermediate frequency. RF amplifiers, detectors, AGC, AVC, FM receivers, AFC.

UNIT – IV :

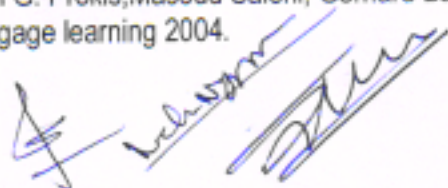
Nyquist sampling theorem, TDM, pulse modulations & PCM, quantization error, necessity of non linear quantizer, A-law, μ -law, FSK & PSK, QPSK, QAM. Source of noise, noise figure, noise bandwidth, effective noise temperature, performance of AM, FM & digital system in presence of noise.

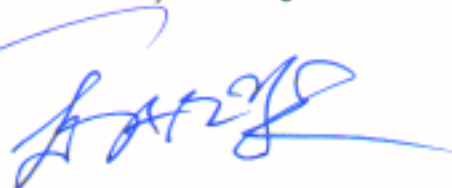
UNIT – V :

Satellite system block diagram, satellite freq. bands, satellite multiple access Format like TDMA, FDMA, transponders, earth station & satellite eclipses, Link calculation

References-

1. Taub & shilling, Communication System, TMH
2. Singh & Sapre, Communication System, TMH
3. B.P. Lathi, Modern Digital and ana communication system,
4. Simon Haykins, Communication System. John Willy
5. Wayne Tomasi, Electronic Communication system.
6. Schaum outline Series, Analog and digital communication
7. Martin S. Roden, Analog & Digital Communication System., Discovery Press.
8. Frank R. Dungan, Electronic Communication System, Thomson/Vikas
9. John G. Prokis, Masoud Salehi, Gerhard Bauch, Contemporary communication sytems using MATLAB, Cengage learning 2004.





EE-5305

BE V SEMESTER						
COURSE CONTENTS						
EE-5205	Principles of Management & Economics	L	T	P	Max. Marks	Min. Marks
Duration in hrs.		3	0	0	70	22

Course Objective:

UNIT – I : Management Concept:

Management, Administration and Organization Difference and Relationship between Organization Management and Administration. Importance of Management, Characteristics of Management

UNIT – II : Management:

Scientific Management, Principles of Management, Process of Management, Functions of Management, Levels of Management, Project Management

UNIT – III : Decision Making:

Introduction and Definition, Types of Decisions, Techniques of Decision Making, Decision making under certainty Decision making under uncertainty, Decision Making under risk

UNIT – IV : Managerial Economics:

Introduction, Factors Influencing Manager, Micro and Macro-economics, Theory of the Cost, Theory of the Firm, Theory of Production Function.

UNIT – V : Productivity:

Input-Output Analysis, Micro-economics Applied to Plants and Industrial Undertakings, Production and Production system, Productivity, Factors affecting Productivity, Increasing Productivity of Resources

References-

1. Peter Drucker Harper and Row - The Practice of Management.
2. Koontz, Prentice Hall of India - Essentials of Management.
3. Prentice Hall of India - Management Staner.
4. T.N. Chhabra, Dhanpat Rai New Delhi - Principle and Practice of Management
5. T.R. Banga and S.C. Sharma, Economics Khanna -Industrial Organization and Engineering.
6. O.P. Khanna, Dhanpat Rai - Industrial Engineering and Management.
7. Joel Dean, Prentice Hall of India - Managerial Economics.
8. V.L. Mote, Samuel Paul, G.S. Gupta, Tata Mc Graw Hill New Delhi – Managerial Economics Concepts & Cases
9. V.L. Mote, Tata McGraw Hill - Managerial Economics

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