

B.TECH (EEE)+MBA

SEMESTER III

THEORY/ PRACTICALS AND SESSIONALS

S.NO.	CODE NO.	SUBJECT	TEACHING PERIODS			CREDIT
			L	T	P	
1.	03BEE101	Mathematics-III	3	1	0	4
2.	03BEE102	Object Oriented Programming using. C++	3	1	0	4
3.	03BEE103	Circuit Analysis & synthesis	3	1	0	4
4.	03BEE104	Electronics devices &Circuits	3	1	0	4
5.	03BEE105	Electrical & Electronics measurement	3	0	0	3
6.	03BEE106	Data structure and Algorithm	3	0	0	3
7.	03BEE201	Computer Programming Lab	0	0	2	1
8.	03BEE202	Circuit Analysis Lab	0	0	3	2
9.	03BEE203	Electronics Devices & Circuits Lab	0	0	3	2
10.	03BEE204	Electrical & Electronics measurement lab	0	0	3	2
11.	03BEE301	Discipline/Extra-Curricular Activities	0	0	4	1
		TOTAL	18	4	8	30

SEMESTER IV

THEORY/ PRACTICALS AND SESSIONALS

S.No.	Code No.	Subject	Teaching Periods			Credit Points
			P	T	P	
1.	04BEE101	Electrical Machines-I	3	1	0	4
2.	04BEE102	Digital Electronics	3	1	0	4
3.	04BEE103	Electrical Engg. Materials	3	1	0	4
4.	04BEE104	Applied Electronics	3	1	0	4
5.	04BEE105	Linear Integrated circuits	3	0	0	3
6.	04BEE106	Electromagnetic Field Theory	3	0	0	3
7.	04BEE201	Electrical Machines Lab-I	0	0	3	2
8.	04BEE202	Digital Electronics Lab	0	0	3	2
9.	04BEE203	Applied Electronics Lab	0	0	3	2
10.	04BEE204	Integrated circuit Lab	0		3	2
11.	04BEE301	DISCIPLINE & CO CURRICULAR ACTIVITIES	0	0	4	1
		Total	18	4	9	31

SEMESTER V

THEORY/ PRACTICALS AND SESSIONALS

S. No.	Code No.	Subject	Teaching Periods			Credit Points
			P	T	P	
1.	05BEE101	Power Electronics	3	1	0	4
2.	05BEE102	Electrical machines -II	3	1	0	4
3.	05BEE103	Control Systems	3	0	0	3
4.	05BEE104	Analog Communication	3	0	0	3
5.	05BEE105	Trans. and Distri. of Elect. Power	3	0	0	3
6.	05BEE106	Object Oriented Programming Using JAVA	3	0	0	3
7.	05BEE201	Power Electronics Lab	0	0	3	2
8.	05BEE202	Electrical Machines Lab - II	0	0	3	2
9.	05BEE203	Control System Lab	0	0	3	2
10.	05BEE204	Power System Design Lab	0	0	3	2
11.	05BEE301	Discipline/Extra-Curricular Activities	0	0	4	1
		Total	18	2	9	29

SEMESTER VI

THEORY/ PRACTICALS AND SESSIONALS

S. No.	Code No.	Subject	Teaching Periods			Credit Points
			P	T	P	
1.	06BEE101	Modern Control Theory	3	1	0	4
2.	06BEE102	Microprocessor & Microcontroller	3	1	0	4
3.	06BEE103	Protection of Power System	3	1	0	4
4.	06BEE104	Advanced Power Electronics	3	0	0	3
5.	06BEE105	Data Structures in C	3	0	0	3
6.	06BEE106	Digital Communication & Info. Theory	3	0	0	3
7.	06BEE201	Microprocessor Lab	0	0	3	2
8.	06BEE202	Power System Lab	0	0	3	2
9.	06BEE203	MATLAB Programming Lab	0	0	3	2
10.	06BEE204	Advanced Power Electronics Lab	0	0	3	2
11.	06BEE301	DISCIPLINE & CO CURRICULAR ACTIVITIES	0	0	4	1
Total			18	3	9	30

SEMESTER VII

THEORY/ PRACTICALS AND SESSIONALS

S.No.	Code No.	Subject	TEACHING PERIOD			Credit Points
			L	T	P	
1.	07BEE101	Database Management Systems	3	0	0	3
2.	07BEE102	Power System Analysis	3	0	0	4
3.	07BEE103	Artificial Intelligence Techniques	3	0	0	4
4.	07BEE104	Utilization of Electrical Power	3	0	0	4
5.	07BEE105	Power System Engineering	3	0	0	3
6.	07BEE106	Computer Aided Design Of Elec. Machines	3	0	0	3
7	07BMD101	Principles and Practice of Management	3	0	0	3
8	07BMD102	Managerial Economics	3	0	0	3
9	07BMD103	International Business Management	3	0	0	3
10.	07BEE201	DBMS Lab	0	0	2	1
11	07BEE202	Power System Modelling & Sim. Lab	0	0	2	1
12	07BEE203	Project Stage I	0	0	2	1
13	07BEE204	Practical Training & Industrial Visit	0	0	2	1
14	07BEE301	DISCIPLINE & CO CURRICULAR ACTIVITIES	0	0	1	1
Total			27	0	9	31

SEMESTER VIII
THEORY/ PRACTICALS AND SESSIONALS

S. No.	Code No.	Subject	TEACHING PERIOD			Credit Points
			L	T	P	
1.	08BEE101	EHV AC/DC Transmission	3	0	0	3
2.	08BEE102	Electric Drives & their Control	3	1	0	4
3.	08BEE103	Switch Gear & Protection	3	1	0	4
5	08BEE104	Non Conventional Energy Sources	3	0	0	3
6	08BMD101	Human Resource Management	3	0	0	3
7	08BMD102	Marketing Management	3	0	0	3
8	08BMD103	Financial Management	3	0	0	3
9	08BMD104	Management Information system	3	0	0	3
10	08BEE201	Industrial Economic & Management	0	0	2	1
11	08BEE202	Electrical Drives & Control Lab	0	0	2	1
12	08BEE204	SEMINAR	0	0	2	1
13	08BEE205	PROJECT STAGE-II	0	0	2	1
14	08BEE301	DISCIPLINE & CO CURRICULAR ACTIVITIES	0	0	0	1
			24	2	10	31

SEMESTER IX

Subject Code		Name of Subject	Teaching Period			Credits
			L	T	P	
Compulsory Papers						
09BMD101		Business Policy & strategic Management	4	0	0	4
09BMD102		Operation & Product Management	4	0	0	4
09BMD103		Research Methods in Management	4	0	0	4
09BMD104		Summer Training & Project Management	3	0	0	3
Optional Papers (Major)-V						
(Finance)	09BMD105	International Financial Management	4	1	0	4
(Marketing)	09BMD106	International Marketing	4	1	0	5
(Human Resource)	09BMD107	Strategic Human Resource Management	4	1	0	5
Optional Papers (Major)-VI						
(Finance)	09BMD108	Investment Management & Security Analysis	4	1	0	5
Marketing)	09BMD109	Advertisement Management	4	1	0	5
Human Resource)	09BMD110	Training & development	4	1	0	5
Optional Paper (Minor) VII 1st paper of other two group (Not of Major Group selected)			4	0	0	5
09BMD301		Discipline & Extra Curricular Activities	0	0	0	1
			30	0	0	30

NOTE:-

- In IX Semester student has to study all compulsory paper, two major optional paper & one minor paper)
- Optional minor papers (Marketing/H.R./ Finance) will be 1st paper of other two group. (Not of Major Group selected)
- Major paper could be obtain from any group (i.e. a group A/B/C)
- A student has to select minor paper from the group A/B/C for the respective semester.

Semester X

Subject Code	Name of Subject	Teaching Period			Credits
		L	T	P	
Compulsory Paper					
10 BMD101	Social Responsibility & Business Ethics & Law	4	0	0	4
10 BMD102	Project Management	4	0	0	4
Major Optional Paper III					
10 BMD103(Finance)	Management of Financial Services	4	1	0	5
10 BMD104(Marketing)	Sales & Distribution Management				
10 BMD105(Human Resource)	Leadership Skill & Change Management				
Major Optional Paper IV					
10 BMD106(Finance)	Finance For Strategic Decisions	4	1	0	5
10 BMD107(Marketing)	Product & Brand Management				
10 BMD108(Human Resource)	Human Resource Planning				
Major Optional Paper V					
10 BMD109(Finance)	Banking Services & Operation	4	1	0	5
10 BMD110(Marketing)	Marketing of Services				
10 BMD111(Human Resource)	Performance Management & Retention Strategies				
Optional Minor Paper 1st paper of other two group (Not of Major Group selected)		4	1	0	5
10BMD301	Discipline & Extra Curricular Activities	0	0	2	1
Total		24	4	2	29

Note

- In X semester student has to study two compulsory papers, three major optional papers, and one minor paper.
- Optional Minor paper (Marketing/H.R./Finance) will be 1st paper of other two group (Not of Major Group selected)

B. TECH.

ELECTRICAL & ELECTRONICS ENGINEERING

III-SEMESTER

03BEE101 MATHEMATICS-III

Unit-1 **LAPLACE TRANSFORM:** Laplace transform with its simple properties, applications to the Solution of ordinary and partial differential equations having constant coefficients with special reference to wave and diffusion equations, digital transforms.

Unit-2 **FOURIER TRANSFORM:** Discrete Fourier transform, Fast Fourier transform, Complex form of Fourier transform and its inverse applications, Fourier transform for the solution of partial differential equations having constant coefficients with special reference to heat equation and wave equation.

Unit-3 **FOURIER SERIES:** Expansion of simple functions in Fourier series, half range series, changes of interval, harmonic analysis. **CALCULUS OF VARIATION:** Functional, strong and weak variations, simple variation problems, Euler's equation

Unit-4 **COMPLEX VARIABLES:** Analytic functions, Cauchy-Riemann equations, Elementary conformal mapping with simple applications, Line integral in complex domain, Cauchy's theorem, Cauchy's integral formula.

Unit-5 **COMPLEX VARIABLES:** Taylor's series, Laurent's series, poles, Residues. Evaluations of simple definite real integrals using the theorem of residues. Simple contour integration.

03BEE102 OBJECT ORIENTED PROGRAMMING USING C++

Unit-1 **PROGRAMMING IN C:** Review of basics of C. structure & pointer type. Variables. Singly and doubly linked lists. I/O and text file handling. Command line arguments.

Unit-2 **OOP FUNDAMENTALS:** Concept of class and object. Attributes, public, private and protected members. Derived classes. Single & multiple inheritances.

Unit-3 **PROGRAMMING IN C++:** Enhancements in C++ over C in data types, operators and functions. Inline functions, constructors and destructors. Friend function. Function and operator overloading.

Unit-4 Working with class and derived classes. Single and multiple and multilevel inheritances and their combinations. Virtual functions, pointers to objects.

Unit-5 Working with text files. Templates. File handling in C++, Input output flags and formatting operations.

03BEE103 CIRCUIT ANALYSIS & SYNTHESIS

Unit-1 **NETWORK THEOREMS AND ELEMENTS:** Thevenin's, Norton's, Reciprocity, Superposition, Compensation, Miller's, Tellegen's and maximum power transfer theorems. Networks with dependent sources. Inductively coupled circuits - mutual inductance, coefficient of coupling and mutual inductance between portions of same circuits and between parallel branches. Transformer equivalent, inductively and conductively coupled circuits.

Unit-2 **TRANSIENT ANALYSIS:** Impulse, step, ramp and sinusoidal response Analysis of first order and second order circuits. Time domain & transform domain (frequency, Laplace) analysis. Initial and final value theorems. Complex periodic waves and their analysis by Fourier analysis. Different kind of symmetry. Power in a circuit.

Unit-3 **NETWORK FUNCTIONS:** Terminals and terminal pairs, driving point impedance transfer functions, poles and zeros. Procedure of finding network functions for general two terminal pair networks. Stability & causality

Unit-4 **TWO PORT NETWORKS:** Two port parameters and their interrelations - z-parameters, y - parameters, h-parameters, ABCD parameters. Equivalence of two ports, transformer equivalent, interconnection of two port networks. Image parameters. Attenuation & phase shift in symmetrical T and Π Networks.

Unit-5 **NETWORK SYNTHESIS:** Hurwitz polynomial, positive real function, reactive networks. Separation property for reactive networks. The four-reactance function forms, specification for reactance function. Foster form of reactance networks. Cauer form of reactance networks. Synthesis of R-L and R-C networks in Foster and Cauer forms.

03BEE104 ELECTRONIC DEVICES & CIRCUITS

Unit-1 **SEMICONDUCTOR PHYSICS :** Mobility and conductivity, charge densities in a semiconductor, Fermi Dirac distribution, carrier concentrations and fermi levels in semiconductor, Generation and recombination of charges, diffusion and continuity equation, Mass action Law, Hall effect.

Unit-2 Junction diodes, Diode as a circuit element, load line concept, clipping and clamping circuits, Voltage multipliers. Construction, characteristics and working principles of UJT

Unit-3 Transistor characteristics, Current components, Current gains: alpha and beta. Operating point. Hybrid model, h-parameter equivalent circuits. CE, CB and CC configuration. DC and AC analysis of CE, CC and CB amplifiers. Ebers-Moll model. Biasing & stabilization techniques. Thermal runaway, Thermal stability.

Unit-4 JFET, MOSFET, Equivalent circuits and biasing of JFET's & MOSFET's. Low frequency CS and CD JFET amplifiers. FET as a voltage variable resistor.

Unit-5 **SMALL SIGNAL AMPLIFIERS AT LOW FREQUENCY:** Analysis of BJT and FET, DC and RC coupled amplifiers. Frequency response, midband gain, gains at low and high frequency. Analysis of DC and differential amplifiers, Miller's Theorem. Cascading Transistor amplifiers, Darlington pair. Emitter follower, source follower.

03BEE105 ELECTRICAL & ELECTRONIC MEASUREMENTS

Unit-1 **THEORY OF ERRORS:** Accuracy & precision, Repeatability, Limits of errors, Systematic & random errors Modeling of errors, Probable error & standard deviation, Gaussian error analysis, Combination of errors.

Unit-2 **ELECTRONIC INSTRUMENTS FOR MEASURING BASIC PARAMETERS:**

Electronic Voltmeter, Electronic Multimeters, Digital Voltmeter, Component Measuring Instruments, Q meter, Vector Impedance meter, RF Power & Voltage Measurements. Measurement of frequency. Introduction to shielding & grounding.

Unit-3 **OSCILLOSCOPES:** CRT Construction, Basic CRO circuits, CRO Probes, Oscilloscope Techniques of Measurement of frequency, Phase Angle and Time Delay, Multibeam, multi trace, storage& sampling Oscilloscopes. Curve tracers. Diaphragms, Seismic Accelerometers, Tachogenerators, Load Cell, Piezoelectric Transducers, Ultrasonic Flow Meters.

Unit-4 **SIGNAL GENERATION:** Sine wave generators, Frequency synthesized signal generators, Sweep frequency generators. Signal Analysis - Measurement Technique, Wave Analyzers, and Frequency - selective wave analyzer, heterodyne wave analyzer, Harmonic distortion analyzer, and Spectrum analyzer.

Unit-5 **TRANSDUCERS:** Classification, Selection Criteria, Characteristics, Construction, Working Principles, Application of following Transducers- RTD, Thermocouples, Thermistors, LVDT, RVDT, Strain Gauges, Bourdon Tubes, Bellows. Diaphragms, Seismic Accelerometers, Tachogenerators, Load Cell, Piezoelectric Transducers, Ultrasonic Flow Meters

03BEE106 DATA STRUCTURES & ALGORITHMS

Unit-1 **Data Structure:** Definition, Implementation, Operation, Application, Algorithm writing and convention, Analysis of algorithm, Complexity Measures and Notations. Arrays: Representation of arrays (multidimensional), Address calculation using column and row major ordering. Linked Lists : Implementation, Doubly linked list, Circular linked list, unrolled linked list, skip-lists, Splices, Sentinel nodes, Application (Sparse Matrix, Associative Array, Functional Programming

Unit-2 **Stacks:** Definition, Implementation, Application (Tower of Hanoi, Function Call and return, Parentheses Matching, Back-tracking, and Expression Evaluation) Queues: Definition, deque, enqueue, priority queue, bounded queue, Implementation, Application

Unit-3 **Tree:** Definition of elements, Binary *trees:* Types (Full, Complete, Almost complete), Binary Search Tree, Traversal (Pre, In, Post & Level order), Pruning, Grafting. Application: Arithmetic Expressions Evaluation Variations: Indexed Binary Tree, Threaded Binary Tree, AVL tree, Multi-way trees, B tree, B+ tree, Forest, Trie and Dictionary

Unit-4 **Graphs:** Elementary definition, Representation (Adjacency Matrix, Adjacency Lists) Traversal (BFS, DFS Application: Spanning Tree (Prim and Kruskal Algorithm), Dijkstra's algorithm, and shortest path algorithms.

Unit-5 **Sorting:** Bubble, Selection, Insertion, Quick, Radix, Merge, Bucket, Heap, Searching: Hashing, Symbol Table, Binary Search, Simple String Searching

03BEE201 COMPUTER PROGRAMMING-I

1 Write a program to find the greatest between four numbers.

- 2 Write a program to prepare mark sheet of students using structure and class.
- 3 Write a C program to read several different names and addresses. re-arrange the names in alphabetical order and print name in alphabetical order using structures and class.
- 4 Write a program to implement concatenation of two strings using pointers.
- 5 Write a program to perform the complex arithmetic.
- 6 Write a program to perform the rational number arithmetic.
- 7 Write a program to perform the matrix operations. (Transpose, Subtraction , addition. multiplication, Test if a matrix is symmetric/lower triangular/ upper triangular)
- 8 Implement Morse code to text conversion and vice-versa.
- 9 To calculate Greatest Common Divisor of given numbers.
- 10 To implement tower of Hanoi problem.
- 11 Write a program to create a singly link list often students names and implement add node, delete node and isemptylist operations.
- 12 Write a program to search a pattern in a given string.
- 13 Write a Program to read add, subtract and multiply integer matrices.
- 14 Write a program to calculate the power function (m^n) using the function overloading technique; implement it for power of integer and double.
- 15 Implement file creation and operate it in different modes: seek, tell, read, write and close operations.
- 16 Using multiple inheritance, prepare students' mark sheet. Three classes containing marks for every student in three subjects. The inherited class generate mark sheet.

03BEE202 CIRCUIT ANALYSIS LAB

- 1 Verification of principle of superposition with dc and ac Sources.
- 2 Verification of Thevenin, Norton's theorems in ac circuits.
- 3 Verification of Maximum power transfer theorem.
- 4 Determination of transient response of Current in RL and RC circuits with step voltage input .
- 5 Determination of transient response of current in RLC circuit with step voltage input for under damp, critically damp and over damp cases.
- 6 Determination of frequency response of current in RLC circuit with sinusoidal ac input.
- 7 Determination of z and h parameters (dc only) for a network and computation of Y and ABCD parameters.
- 8 Determination of driving point and transfer functions of a two-port ladder network and verify Y with theoretical values.

03BEE203 ELECTRONICS DEVICES & CIRCUITS LAB

- 1 Study the following devices:
 - (a) Analog & digital multimeters
 - (b) Function/ Signal generators
 - (c) Regulated d. c. power supplies (constant voltage and constant current operations)
 - (d) Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous figures.
- 2 Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances.
- 3 Plot V-I characteristic of zener diode and study of zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator.

- 4 Plot frequency response curve for single stage amplifier and to determine gain bandwidth product.
- 5 Plot drain current - drain voltage and drain current - gate bias characteristics of field effect transistor and measure of I_{dss} & V_p
- 6 Application of Diode as clipper & clamper
- 7 Plot gain- frequency characteristic of two stage RC coupled amplifier & calculate its bandwidth and compare it with theoretical value.
- 8 Plot gain- frequency characteristic of emitter follower & find out its input and output resistances.
- 9 Plot input and output characteristics of BJT in CB, CC and CE configurations. Find their h parameters.
- 10 Study half wave rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor.
- 11 Study bridge rectifier and measure the effect of filter network on D.C. voltage output & ripple factor.

03BEE204 ELECTRICAL AND ELECTRONICS MEASUREMENT LAB

- 1 Measure earth resistance using fall of potential method.
- 2 Plot V-I characteristics & measure open circuit voltage & short circuit current of a solar panel.
- 3 Measure unknown inductance capacitance resistance using following bridges (a) Anderson Bridge (b) Maxwell Bridge
- 4 To measure unknown frequency & capacitance using Wein's bridge.
- 5 Measurement of the distance with the help of ultrasonic transmitter & receiver.
- 6 Measurement of displacement with the help of LVDT.
- 7 Draw the characteristics of the following temperature transducers: (a) RTD (Pt-100) (b) Thermistors (c) Thermocouple
- 8 Draw the characteristics between temperature & voltage of a K type thermocouple
- 9 Measure the speed of a Table Fan using stroboscope.
- 10 Measurement of strain/ force with the help of strain gauge load cell.
- 11 Study the working of Q-meter and measure Q of coils.
- 12 To study the working of Spectrum analyzer and determine the bandwidth of different signals.

B. TECH.

ELECTRICAL & ELECTRONICS ENGINEERING IV-SEMESTER

04BEE101 ELECTRICAL MACHINES-I

Unit-1 **ELECTROMECHANICAL ENERGY CONVERSION:** Basic principles of Electromechanical energy conversion. Basic aspects and physical phenomena involved in energy conversion. Energy balance.

Unit-2 **DC GENERATORS:** Construction, Types of DC generators, emf equation, lap & wave windings, equalizing connections, armature reaction, commutation, methods of

improving commutations, demagnetizing and cross magnetizing mmf, interpoles, characteristics, parallel operation. Rosenberg generator.

Unit-3 **DC MOTORS:** Principle, back emf, types, production of torque, armature reaction & interpoles, characteristics of shunt, series & compound motor, DC motor starting. Speed Control of DC Motor: Armature voltage and field current control methods, Ward Leonard method. Braking, losses and efficiency, direct & indirect test, Swinburne's test, Hopkinson test, field & retardation test, single-phase series motor.

Unit-4 **TRANSFORMERS:** Construction, types, emf equation. No load and load conditions. Equivalent circuits, Vector diagrams, OC and SC tests, Sumpner's back-to-back test, efficiency. Voltage regulation, effect of frequency, parallel operation, autotransformers, switching currents in transformers, separation of losses.

Unit-5 **POLYPHASE TRANSFORMERS:** Single unit or bank of single-phase units, polyphase connections, Open delta and V connections, Phase conversion: 3 to 6 phase and 3 to 2 phase conversions, Effect of 3-phase winding connections on harmonics, 3-phase winding transformers, tertiary winding.

04BEE102 DIGITAL ELECTRONICS

Unit-1 **NUMBER SYSTEMS, BASIC LOGIC GATES & BOOLEAN ALGEBRA:** Binary Arithmetic & Radix representation of different numbers. Sign & magnitude representation, complement notation, various codes & arithmetic in different codes & their inter conversion. Features of logic algebra, postulates of Boolean algebra. Theorems of Boolean algebra. Boolean function. Derived logic gates: Exclusive-OR, NAND, NOR gates, their block diagrams and truth tables. Logic diagrams from Boolean expressions and vice-versa. Converting logic diagrams to universal logic. Positive, negative and mixed logic. Logic gate conversion.

Unit-2 **DIGITAL LOGIC GATE CHARACTERISTICS:** TTL logic gate characteristics. Theory & operation of TTL NAND gate circuitry. Open collector TTL. Three state output logic. TTL subfamilies. MOS & CMOS logic families. Realization of logic gates in RTL, DTL, ECL, CMOS & MOSFET. Interfacing logic families to one another.

Unit-3 **MINIMIZATION TECHNIQUES:** Minterm, Maxterm, Karnaugh Map, K map upto 4 variables. Simplification of logic functions with K-map, conversion of truth tables in POS and SOP form. Incomplete specified functions. Variable mapping. Quinn-McKlusky minimization techniques.

Unit-4 **COMBINATIONAL SYSTEMS:** Combinational logic circuit design, half and full adder, subtractor. Binary serial and parallel adders. BCD adder. Binary multiplier. Decoder: Binary to Gray decoder, BCD to decimal, BCD to 7-segment decoder. Multiplexer, demultiplexer, encoder. Octal to binary, BCD to excess-3 encoder. Diode switching matrix. Design of logic circuits by multiplexers, encoders, decoders and demultiplexers.

Unit-5 **SEQUENTIAL SYSTEMS:** Latches, flip-flops, R-S, D, J-K, Master Slave flip flops. Conversions of flip-flops. Counters: Asynchronous (ripple), synchronous and synchronous decade counter, Modulus counter, skipping state counter, counter design. Ring counter. Counter applications. Registers: buffer register, shift register.

04BEE103 ELECTRICAL ENGINEERING MATERIALS

Unit-1 **DIELECTRIC MATERIALS:** Polarization phenomenon, spontaneous polarization, dielectric constant and loss, piezo and Ferro electricity application.

Unit-2 **MAGNETIC MATERIALS:** Dia, Para, ferro- ferrimagnetisms; soft and hard magnetic materials and their applications.

Unit-3 **SEMI CONDUCTOR MATERIALS:** Crystal growth, zone refining, Degenerate and no degenerate semiconductors, Direct and indirect band gap semiconductors. Electronic properties

of silicon, Germanium, Compound Semiconductor, Gallium Arsenide, gallium phosphide & Silicon carbide.

Unit-4 **CONDUCTIVE & SUPERCONDUCTIVE MATERIALS:** Electrical properties of conductive and resistive materials. Important characteristics and electronic applications of specific conductor & resistance materials. Superconductor phenomenon, Type I and Type II superconductors and their applications.

Unit-5 **PASSIVE COMPONENTS & PCB FABRICATION:** Brief study of fabrication methods of fixed and variable type of resistors; capacitors, Inductors, solenoid and toroid, air core, iron core and Ferro core conductors. Printed Circuit Boards - Types, Manufacturing of copper clad laminates, PCB Manufacturing process, Manufacturing of single and double sided PCBs. Surface mount devices - advantages & limitations.

04BEE104 APPLIED ELECTRONICS

Unit-1 **FEEDBACK AMPLIFIERS:** Classification, Feedback concept, Transfer gain with feedback, General characteristics of negative feedback amplifiers. Analysis of voltage-series, voltage-shunt, current-series and current-shunt feedback amplifier, Stability criterion.

Unit-2 **OSCILLATORS:** Classification, Criterion for oscillation. Tuned collector, Hartley, Colpitts, RC-Phase shift, Wien bridge and crystal oscillators, Astable, monostable and bistable multivibrators. Schmitt trigger. Blocking oscillators.

Unit-3 **HIGH FREQUENCY AMPLIFIERS:** Hybrid pie model, conductances and capacitances of hybrid-pie model, high frequency analysis of CE amplifier, gain-bandwidth product. Emitter follower at high frequencies.

Unit-4 **DIGITAL LOGIC GATE CHARACTERISTICS:** TTL logic gate characteristics. Theory & operation of TTL NAND gate circuitry, Open collector TTL. Three state output logic. TTL subfamilies, MOS & CMOS logic families. Realization of logic gates in RTL, DTL, ECL, CMOS & CMOS logic families. Realization of logic gates in RTL, DTL, ECL, CMOSFET. Interfacing logic families to one another.

Unit-5 **POWER AMPLIFIERS:** Power amplifier circuits, Class A output stages, class B output stage and class AB output stages class C amplifiers, pushpull amplifiers with and without transformers. Complementary symmetry & quasi complementary symmetry amplifiers

04BEE105 LINEAR INTEGRATED CIRCUITS

Unit-1 **OPERATIONAL AMPLIFIERS:** Basic differential amplifier analysis, Single ended and double ended configurations, Op-amp configurations with feedback, Op-amp parameters, Inverting and Non-Inverting configuration, Comparators, Adder.

Unit-2 **OPERATIONAL AMPLIFIER APPLICATIONS:** Integrator, Differentiator, Voltage to frequency & Frequency to voltage converters. Oscillators: Phase shift, Wien

bridge, Quadrature, square wave, triangular wave, saw tooth oscillators. Voltage controlled oscillators.

Unit-3 **ACTIVE FILTERS:** Low pass, high pass, band pass and band reject filters, All pass filter, Switched capacitor filter, Butterworth filter design, Chebyshev Filter design.

Unit-4 **PHASE-LOCKED LOOPS:** Operating Principles of PLL, Linear Model of PLL, Lock range, Capture range, Applications of PLL as FM detector, FSK demodulator, AM detector, Frequency translator, phase shifter, tracking filter, signal synchronizer and frequency synthesizer, Building blocks of PLL, LM565 PLL.

Unit-5 **LINEAR IC's:** Four quadrant multiplier & its applications, Basic blocks of linear IC voltage regulators, Three terminal voltage regulators, Positive and negative voltage regulators. The 555 timer as astable and monostable multivibrators. Zero crossing detector, Schmitt trigger.

04BEE106 ELECTROMAGNETIC FIELD THEORY

Unit-1 **INTRODUCTION:** Vector Relation in rectangular, cylindrical, spherical and general curvilinear coordinates system. Concept and physical interpretation of gradient, Divergence and curl, Green's & Stoke's theorems.

Unit-2 **ELECTROSTATICS:** Electric field intensity & flux density. Electric field due to various charge configurations. The potential functions and displacement vector. Gauss's law. Poisson's and Laplace's equation and their solution. Uniqueness theorem. Continuity equation. Capacitance and electrostatics energy. Field determination by method of images. Boundary conditions. Field mapping and concept of field cells.

Unit-3 **MAGNETOSTATICS :** Magnetic field intensity, flux density & magnetization, Faraday's Law, Bio-Savart's law, Ampere's law, Magnetic scalar and vector potential, self & mutual inductance, Energy stored in magnetic field, Boundary conditions, Analogy between electric and magnetic field, Field mapping and concept of field cells.

Unit-4 **TIME VARYING FIELDS:** Displacement currents and equation of continuity. Maxwell's equations, Uniform plane wave in free space, dielectrics and conductors, skin effect sinusoidal time variations, reflection & refraction of Uniform Plane Wave, standing wave ratio. Pointing vector and power considerations.

Unit-5 **RADIATION, EMI AND EMC:** Retarded Potentials and concepts of radiation, Radiation from a small current element. Radiation resistance: Introduction to Electromagnetic Interference and Electromagnetic compatibility, EMI coupling modes, Methods of eliminating interference, shielding, grounding, conducted EMI, EMI testing: emission testing, susceptibility testing.

04BEE201 ELECTRICAL MACHINES LAB-I

1 Speed control of D.C. shunt motor by (a) Field current control method & plot the curve for speed vs field current. (b) Armature voltage control method & plot the curve for speed vs armature voltage.

2 Speed control of a D.C. Motor by Ward Leonard method and to plot the curve for speed vs applied armature voltage.

3 To determine the efficiency of D.C. Shunt motor by loss summation (Swinburne's) method.

4 To determine the efficiency of two identical D.C. Machine by Hopkinson's regenerative test.

5 To perform O.C. and S.C. test on a 1-phase transformer and to determine the parameters of its equivalent circuit its voltage regulation and efficiency.

6 To perform back-to-back test on two identical 1-phase transformers and find their efficiency & parameters of the equivalent circuit.

7 To perform parallel operation of two 1-phase transformers and determine their load sharing.

8 To determine the efficiency and voltage regulation of a single-phase transformer by direct loading.

9 To perform OC & SC test on a 3-phase transformer & find its efficiency and parameters of its equivalent circuit.

10 To perform parallel operation of two 3-phase transformers and determine their load sharing.

11 To study the performance of 3-phase transformer for its various connections, i.e. star/star star/delta delta/star and delta/delta and find the magnitude of 3rd harmonic current.

04BEE202 DIGITAL ELECTORNICS LAB

1. To study and perform the following experiments.

(a) Operation of digital multiplexer and demultiplexer. (b) Binary to decimal encoder.

(c) Characteristics of CMOS integrated circuits.

2 To study and perform experiment- Compound logic functions and various combinational circuits

based on AND/NAND and OR/NOR Logic blocks.

3 To study and perform experiment -Digital to analog and analog to digital converters.

4 To study and perform experiment- Various types of counters and shift registers.

5 To study and perform experiment - Interfacing of CMOS to TTL and TTL to CMOS ICs.

6 To study and perform experiment- BCD to binary conversion on digital IC trainer.

7 To study and perform experiment -

(a) Astable (b) Monostable (c) Bistable Multivibrators and the frequency variation with different

parameters, observe voltage waveforms at different points of transistor.

8 To study and perform experiment -Voltage comparator circuit using IC-710.

9 To study and perform experiment- Schmitt transistor binary circuit.

10 Design 2 bit binary up/down binary counter on bread board.

04BEE203 APPLIED ELECTRONICS LAB

1 Plot gain-frequency characteristics of BJT amplifier with and without negative feedback in the emitter circuit and determine bandwidths, gain bandwidth products and gains at 1kHz with and without negative feedback.

2 Study of series and shunt voltage regulators and measurement of line and load regulation and ripple factor.

3 Plot and study the characteristics of small signal amplifier using FET.

4 Study of push pull amplifier. Measure variation of output power & distortion with load.

5 Study Wein bridge oscillator and observe the effect of variation in R & C on oscillator frequency.

- 6 Study transistor phase shift oscillator and observe the effect of variation in R & C on oscillator frequency and compare with theoretical value.
- 7 Study the following oscillators and observe the effect of variation of C on oscillator frequency:
(a) Hartley (b) Colpitts.
- 8 Design Fabrication and Testing of k-derived filters (LP/HP).
- 9 Study of a Digital Storage CRO and store a transient on it.
- 10 To plot the characteristics of UJT and UJT as relaxation.
- 11 To plot the characteristics of MOSFET and CMOS.

04BEE204 INTEGRATED CIRCUITS LAB

- 1 Op-Amp characteristics and get data for input bias current measure the output-offset voltage and reduce it to zero and calculate slew rate.
- 2 Op-Amp in inverting and non-inverting modes.
- 3 Op-Amp as scalar, summer and voltage follower. 4
Op-Amp as differentiator and integrator.
- 5 Design LPF and HPF using Op-Amp 741
- 6 Design Band Pass and Band reject Active filters using Op-Amp 741.
- 7 Design Oscillators using Op-Amp (i) RC phase shift (ii) Hartley (iii) Colpitts
- 8 Design (i) Astable (ii) Monostable multivibrators using IC-555 timer
- 9 Design Triangular & square wave generator using 555 timer.
- 10 Design Amplifier (for given gain) using Bipolar Junction Transistor.

B. TECH.

ELECTRICAL & ELECTRONICS ENGINEERING V-SEMESTER

05BEE101 POWER ELECTRONICS

Unit-1 Power Semiconductor Devices: Characteristics of Power Transistor, Thyristor, GTO, Power MOSFET and IGBT. Two-Transistor Model of Thyristor.

Unit-2 SCR: Construction and characteristics, specification and ratings, pulse transformer, optical isolators, methods of turn on: R, RC, UJT relaxation oscillator, Rating extension by series and parallel connections, string efficiency. Protection of SCR Protection against over voltage, over current, dv/dt, di/dt, Gate protection.

Unit-3 Converters-I: Single Phase half & full wave converters with RL load, Single phase dual converters, Three phase half wave converters, Three phase full converters with RL load, Three phase dual converters.

Unit-4 Converters-II: Single and three-phase semi converters with RL load. Power Factor Improvement-Extinction angle control, symmetrical angle control, pulse width modulation control and sinusoidal pulse width modulation control. Inversion operation. Effect of load and source impedances.

Unit-5 DC-DC Converters: Choppers: Step Up/Down Converter, Chopper Configurations, analysis of type A Chopper Commutation of Choppers. Switched Mode Regulators-buck, boost, buckboost and cuk regulator.

05BEE102ELECTRICAL MACHINES-II

Unit-1 Introduction: General equation of induced emf, AC armature windings: concentric and distributed winding, chording, skewing, effect on induced emf. Armature and field mmf, effect of power factor and current on armature mmf, harmonics. Rotating fields.

Unit-2 Induction Motors: Construction of squirrel cage & slip ring induction motor, basic principles, flux and mmf waves, induction motor as a transformer. Equivalent circuits, torque equation, torque-slip curves, no load & block rotor tests, circle diagram, performance calculation. Effect of rotor resistance. Cogging, Crawling. Double cage squirrel cage induction motor, induction generator, induction regulator.

Unit-3 Starting & Speed Control of Induction Motors: Various methods of starting & speed control of squirrel cage & slip ring motor, cascade connection, braking.

Single-Phase Induction Motor: Revolving field theory, starting methods, equivalent circuits.

Unit-4 Synchronous Generator: Construction, types, excitation systems, principles. Equation of induced emf, flux and emf waves, theory of cylindrical rotor and salient pole machines, two reactance theory, phasor diagrams, power developed, voltage regulation, OC & SC tests, zero power factor characteristics, potier triangle and ASA method of finding voltage regulation, synchronization, parallel operation, hunting and its prevention.

Unit-5 Synchronous Motors: types, construction, principle, phasor diagrams, speed torque characteristics, power factor control, V-curves, starting methods, performance calculations, applications, synchronous condenser, synchronous induction motor.

05BEE103 CONTROL SYSTEMS

Unit-1 Introduction: Elements of control systems, concept of open loop and closed loop systems., Examples and application of open loop and closed loop systems, brief idea of multivariable control systems.

Unit-2 Mathematical Modeling of Physical Systems: Representation of physical system (Electro Mechanical) by differential equations, Determination of transfer function by block diagram reduction techniques and signal flow method, Laplace transformation function, inverse Laplace transformation.

Unit-3 Time Response Analysis of First Order and Second Order System: Characteristic equations, response to step, ramp and parabolic inputs, transient response analysis, steady state errors and error constants, Transient & steady state analysis of LTI systems.

Unit-4 Stability of the System: Absolute stability and relative stability, Routh's stability criterion, root locus method of analysis, polar plots, Nyquist stability criterion. M and N Loci, Nichols chart.

Unit-5 Elementary Ideas of Compensation, Networks: Lag, lead and log lead networks, brief idea of proportional, derivative and integral controllers.

05BEE104 ANALOG COMMUNICATION

UNIT 1: NOISE EFFECTS IN COMMUNICATION SYSTEMS: Resistor noise, Networks with reactive elements, Noise temperature, Noise bandwidth, effective input noise temperature, Noise figure. Noise figure & equivalent noise temperature in cascaded circuits.

UNIT 2 : AMPLITUDE MODULATION : Frequency translation, Recovery of base band signal, Spectrum & power relations in AM systems. Methods of generation & demodulation of AM-DSB, AMDSB/ SC and AM-SSB signals. Modulation & detector circuits for AM systems. AM transmitters & receivers.

UNIT 3: FREQUENCY MODULATION : Phase & freq. modulation & their relationship, Spectrum & band width of a sinusoidally modulated FM signal, phasor diagram, Narrow band & wide band FM. Generation & demodulation of FM signals. FM transmitters & receivers.. Comparison of AM, FM & PM. Pre emphasis & deemphasis. Threshold in FM, PLL demodulator.

UNIT 4: NOISE IN AM AND FM: Calculation of signal-to-noise ratio in SSB-SC, DSB-SC, DSB with carrier, Noise calculation of square law demodulator & envelope detector. Calculation of S/N ratio in FM demodulators, Super heterodyne receivers.

UNIT 5: PULSE ANALOG MODULATION : Practical aspects of sampling: Natural and flat top sampling. PAM, PWM, PPM modulation and demodulation methods, PAM-TDM.

05BEE105 TRANSMISSION & DISTRIBUTION OF ELECTRICAL POWER

Unit-1 **(i) Supply systems:** - Basic network of power system. Transmission and distribution voltage, effect of system voltage on size of conductor and losses. Comparison of DC 2- wire, DC 3- wire, 1- phase AC and 3- phase AC (3- wire and 4- wire) systems.

(ii) Distribution Systems: -

Primary and secondary distribution systems, feeder, distributor and service mains. Radial and ring- main distribution systems. Kelvin's law for conductor size.

Unit-2 **Mechanical features of overhead lines:-** Conductor material and types of conductor. Conductor arrangements and spacing. Calculation of sag and tension, supports at different levels, effect of wind and ice loading, stringing chart and sag template. Conductor vibrations and vibration dampers.

Unit-3 **Parameters of Transmission Lines:** Resistance inductance and capacitance of overhead lines, effect of earth, line transposition. Geometric mean radius and distance. Inductance and capacitance of line with symmetrical and unsymmetrical spacing Inductance and capacitance of double circuit lines. Skin and proximity effects. Equivalent circuits and performance of short and medium transmission lines.

Unit-4 **(i)** Generalized ABCD line constants, equivalent circuit and performance of long transmission line. Ferranti effect. Interference with communication circuits. Power flow through a transmission line **(ii) Corona:** Electric stress between parallel conductors. Disruptive critical voltage and visual critical voltage, Factors affecting corona. Corona power loss. Effects of corona.

Unit-5 **(i) Insulators:** Pin, shackle, suspension, post and strain insulators. Voltage distribution across an insulator string, grading and methods of improving string efficiency. **(ii) Underground**

Cables: Conductor, insulator, sheathing and armoring materials. Types of cables. Insulator resistance and capacitance calculation. Electrostatic stresses and reduction of maximum stresses. Causes of breakdown. Thermal rating of cable. Introduction to oil filled and gas filled cables.

05BEE106 OBJECT ORIENTED PROGRAMMING USING JAVA

Unit I JAVA: Variation from C++ to JAVA. Introduction to Java byte code, virtual machine, Program Elements : Primitive data types, variables, assignment, arithmetic, short circuit logical operators, Arithmetic operators, bit wise operators, relational operators, boolean logic operators, the assignment operators, operator

precedence. Decision and control statements, arrays.

Unit II Objects and classes: Objects, constructors, returning and passing objects as parameter. Nested and inner classes. Single and Multilevel Inheritance, Extended classes, Access Control, usage of super. Overloading and overriding methods. Abstract classes. Using final with inheritance.

Unit III Package and Interfaces: Defining package, concept of CLASSPATH, access protection, importing package. Defining and implementing interfaces.

String Handling: String constructors, special string operations, character extraction, searching and comparing strings, string Buffer class.

Unit IV Exception Handling: Exception handling fundamentals, Exception types, uncaught exceptions, try, catch and multiple catch statements. Usage of throw, throws and finally.

Unit V Applet: Applet Fundamentals, using paint method and drawing polygons, file management (Input/Output) in JAVA.

05BEE201 POWER ELECTRONICS LAB

1 Study the comparison of following power electronics devices regarding ratings, performance characteristics and applications: Power Diode, Power Transistor, Thyristor, Diac, Triac, GTO, MOSFET, MCT and SIT.

2 Determine V-I characteristics of SCR and measure forward breakdown voltage, latching and holding currents.

3 Find V-I characteristics of TRIAC and DIAC.

4 Find output characteristics of MOSFET and IGBT.

5 Find transfer characteristics of MOSFET and IGBT.

6 Find UJT static emitter characteristics and study the variation in peak point and valley point.

7 Study and test firing circuits for SCR-R, RC and UJT firing circuits.

8 Study and test 3-phase diode bridge rectifier with R and RL loads. Study the effect of filters.

9 Study and obtain waveforms of single-phase half wave controlled rectifier with and without filters. Study the variation of output voltage with respect to firing angle.

10 Study and obtain waveforms of single-phase half controlled bridge rectifier with R and RL loads. Study and show the effect of freewheeling diode.

11 Study and obtain waveforms of single-phase full controlled bridge converter with R and RL loads. Study and show rectification and inversion operations with and without freewheeling diode.

12 Control the speed of a dc motor using single-phase half controlled bridge rectifier and full controlled bridge rectifier. Plot armature voltage versus speed characteristics.

05BEE202 ELECTERICAL MACHINES LAB-II

1 Separation of transformer core losses and to determine the hysteresis and eddy current losses at rated voltage and frequency.

2 To plot the O.C.C. & S.C.C. of an alternator and to determine its regulation by synchronous impedance method.

3 To synchronize an alternator across the infinite bus (RSEB) & summarize the effects of variation of excitation on load sharing.

- 4 To plot the V-curve for a synchronous motor for different values of loads.
- 5 To perform sumpner's back-to-back test on 3 phase transformers, find its efficiency & parameters for its equivalent circuits.
- 6 To perform the heat run test on a delta/delta connected 3-phase transformer and determine the parameters for its equivalent circuit.
- 7 To perform no load and blocked rotor test on a 3 phase induction motor and to determine the parameters of its equivalent circuits. Draw the circle diagram and compute the following (i) Max. Torque (ii) Current (iii) slip (iv) p.f. (v) Efficiency.
- 8 To perform the load test on a 3-phase induction motor and determine its performance characteristics (a) Speed vs load curve (b) p.f. vs load curve (c) Efficiency vs load curve (d) Speed vs torque curve
- 9 Determination of losses and efficiency of an alternator.
- 10 To find X_d and X_q of a salient pole synchronous machine by slip test.

05BEE203 CONTROL SYSTEM LAB

- 1 Introduction to MATLAB Computing Control Software.
- 2 Defining Systems in TF, ZPK form.
- 3 (a) Plot step response of a given TF and system in state-space. Take different values of damping ratio and ω_n natural undamped frequency. (b) Plot ramp response.
- 4 For a given 2nd order system plot step response and obtain time response specification.
- 5 To design 1st order R-C circuits and observe its response with the following inputs and trace the curve. (a) Step (b) Ramp (c) Impulse
- 6 To design 2nd order electrical network and study its transient response for step input and following cases. (a) Under damped system (b) Over damped System. (c) Critically damped system.
- 7 To Study the frequency response of following compensating Networks, plot the graph and find out corner frequencies. (a) Log Network (b) Lead Network (c) Log-lead Network.
- 8 To draw characteristics of a.c servomotor
- 9 To perform experiment on Potentiometer error detector.
- 10 Check for the stability of a given closed loop system.
- 11 Plot bode plot for a 2nd order system and find GM and PM.

05BEE204 POWER SYSTEM DESIGN LAB

- 1 Generating station design: Design considerations and basic schemes of hydro, thermal, nuclear and gas power plants. Electrical equipment for power stations,
- 2 Auxiliary power supply scheme for thermal power plant.
- 3 Distribution system Design: Design of feeders & distributors. Calculation of voltage drops in distributors. Calculation of conductor size using Kelvin's law.
- 4 Methods of short term, medium term and long term load forecasting.
- 5 Sending end and receiving end power circle diagrams.
- 6 Instrument Transformers: Design considerations of CTs & PTs for measurement and protection.
- 7 Substations: Types of substations, various bus-bar arrangements. Electrical equipment for substations.

**B. TECH.
ELECTRICAL & ELECTRONICS ENGINEERING
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06BEE101 MODERN CONTROL THEORY

Unit-1 **Introduction:** Concept of Linear vector space Linear Independence, Bases & Representation, domain and range. Concept of Linearity, relaxedness, time invariance, causality.

Unit-2 **State Space Approach of Control System Analysis:** Modern Vs conventional control theory, concept of state, state variable state vector, state space, state space equations, Writing statespace equations of mechanical, Electrical systems, Analogous systems.

Unit-3 State Space Representation using physical and phase variables, comparison form of system representation. Block diagram representation of state model. Signal flow graph representation. State space representation using canonical variables. Diagonal matrix. Jordan canonical form, Derivation of transfer function from state-model.

Unit-4 **Solution of State Equations:** Diagonalization, Eigenvalues and eigen vectors. Matrix exponential, State transition matrix, Properties of state transition matrix. Computation of State transition matrix concepts of controllability & observability. Pole placement by state feedback, Ackerman's formula

Unit-5 **Digital Control Systems:** Introduction, sampled data control systems, signal reconstruction, difference equations. The z-transform, Z-Transfer Function. Block diagram analysis of sampled data systems, z and s domain relationship, digital PID controller

06BEE102 MICROPROCESSOR AND MICROCONTROLLER

UNIT 1 : INTRODUCTION: CPU, address bus, data bus and control bus. Input/ Output devices, buffers, encoders, latches and memories.

UNIT 2 : 8085 MICROPROCESSOR ARCHITECTURE: Internal data operations and registers, pins and signals, peripheral devices and memory organization, interrupts. CISC and RISC architecture overview.

UNIT 3 : 8085 MICROPROCESSOR INSTRUCTIONS: Classification, format and timing. Instruction set.

Programming and debugging, 8 bit and 16 bit instructions.

UNIT 4 : 8085 MICROPROCESSOR INTERFACING: 8259, 8257, 8255, 8253, 8155 chips and their applications. A/D conversion, memory, keyboard and display interface (8279).

UNIT 5: INTRODUCTION TO 8051 MICROCONTROLLER: General features & architecture of 8051. Memory, timers and interrupts. Pin details. Interfacing and applications.

06BEE103 PROTECTION OF POWER SYSTEM

Unit-1 **(i)** Causes and consequences of dangerous currents: Faults, overloads and switching over currents. Introduction to protection, trip circuit of a circuit breaker. Functional characteristics of a relay, zone of protection, primary and backup protection.

(ii) CTs & PTs: Current transformer construction, measurement and protective CTs. Type of potential transformers. Steady state ratio and phase angle errors in CTs and PTs. Transient errors in CT and CVT (Capacitive Voltage Transformer).

Unit-2 **Overcurrent Protection:** HRC fuse and thermal relay. Overcurrent (OC) relays - instantaneous, definite time, inverse time and inverse definite minimum time overcurrent relays, time and current gradings. Induction disc type relay. Directional overcurrent relay, 30°, 60° and 90° connections. Earth fault relay. Brief description of overcurrent protective schemes for a feeder, parallel feeders and ring mains.

Unit-3 **Generator Protection:** Stator protection - differential and percentage differential protection, protection against stator inter-turn faults, stator overheating protection. Rotor protection against excitation and prime mover failure, field earth fault and unbalanced stator currents (negative sequence current protection).

Unit-4 **(i) Transformer Protection:** Percentage differential protection, magnetizing inrush current, percentage differential relay with harmonic restraint. Buchholz relay. Differential protection of generator transfer unit.

(ii) Busbar Protection: Differential protection of busbars, high impedance relay scheme, frame leakage protection.

Unit-5 **(i) Transmission Line Protection:** Introduction to distance protection.

Construction, operating principle and characteristics of an electromagnetic impedance relay. Effect of arc resistance. Induction cup type reactance and mho relays. Comparison between impedance, reactance and mho relays. Three stepped distance protection of transmission line.

(ii) Induction Motor Protection: Introduction to various faults and abnormal operating conditions, unbalance supply voltage and single phasing. Introduction to protection of induction motors- HRC fuse and overcurrent, percentage differential, earth fault and negative sequence voltage relays.

06BEE104 ADVANCED POWER ELECTRONICS

Unit-1 **AC Voltage Controllers:** Principle of On-Off Control, Principle of Phase control, Single Phase Bi-directional Controllers with Resistive Loads, Single Phase Controllers with Inductive Loads, Three Phase full wave AC controllers, AC Voltage Controller with PWM Control.

Unit-2 **Inverters:** Principle of Operation, Single-phase bridge inverters, Three phase bridge Inverters: 180 and 120 degree of conduction. Voltage control of Single Phase and Three Phase Inverters, Current Source Inverters, Harmonics and its reduction techniques.

Unit-3 **Cycloconverters:** Basic principle of operation, single phase to single phase, threephase to three-phase and three phase to single phase cycloconverters. Output equation, Control circuit.

Unit-4 **DC Power Supplies:** Switched Mode DC Power Supplies, flyback converter, forward converter, half and full bridge converter, resonant DC power supplies,

bidirectional power supplies.

Unit-5 AC Power Supplies: Switched mode power supplies, Resonant AC power supplies, bidirectional AC power supplies. Multistage conversions, Control Circuits: Voltage Mode Control, Current Mode Control

06BEE105 DATA STRUCTURES IN C

Unit-1 Performance Measurement: Space complexity and Time complexity, big oh, omega and theta notations and their significance. Linear Lists - **Array** and linked representation, singly & doubly linked lists. Concept of circular linked lists.

Unit-2 Array & Matrices: Row and Column Major mapping & representation, irregular 2D array, Matrix operations, Special matrices: diagonal, tri-diagonal, triangular and symmetric. Sparse matrices representation and its transpose.

Unit-3 Stacks: Representation in array & linked lists, basic operation, Applications of stacks in parenthesis matching, towers of Hanoi etc. **Queues** - Representation in array & linked lists, applications, circular queues.

Unit-4 Trees: Binary Tree, representation in array & linked lists, basic operation on binary trees, binary tree traversal (preorder, post order, in order). **Search Trees** - Binary search tree, indexed-binary search tree, basic operation, AVL tree, B-tree & Heap Tree.

Unit-5 Graphs: Representation of unweighted graphs, BFS, DFS, and Minimum cost spanning trees, Single source shortest path. **Sorting** - Bubble sort, insertion sort, merge sort, selection sort, quick sort, heap sort.

06BEE106 DIGITAL COMMUNICATION AND INFORMATION THEORY

Unit-1 PCM & DELTA Modulation Systems: PCM and delta modulation, quantization noise in PCM and delta modulation. Signal-to-noise ratio in PCM and delta modulation, T1 Carrier System, Comparison of PCM and DM. Adaptive delta Modulation. Bit, word and frame synchronization, Matched filter detection.

Unit-2 Digital Modulation Techniques: Various techniques of phase shift, amplitude shift and frequency shift keying. Minimum shift keying. Modulation & Demodulation.

Unit-3 Error Probability in Digital Modulation: Calculation of error probabilities for PSK, ASK, FSK & MSK techniques.

Unit-4 Information Theory: Amount of Information, Average Information, Entropy, Information rate, Increase in Average information per bit by coding, Shannon's Theorem and Shannon's bound, Capacity of a Gaussian Channel, BW-S/N trade off, Orthogonal signal transmission.

Unit-5 Coding: Coding of Information, Hamming code, Single Parity-Bit Code, Linear Block code, cyclic code & convolutional code

06BEE201 MICROPROCESSOR LAB

1. Study the hardware, functions, memory structure and operation of 8085 microprocessor kit.
2. Program to perform integer division: (i) 8-bit by 8-bit (ii) 16-bit by 8-bit.
3. Transfer of a block of data in memory to another place in memory in the direct and reverse order.
4. Searching a number in an array and finding its parity.
5. Sorting of array in: (i) Ascending (ii) Descending order
6. Programme to perform following conversion: (i) BCD to ASCII (ii) BCD to

Hexadecimal

7. Programme to multiply two 8-bit numbers.
8. Programme to generate and sum 15 fibonacci numbers.
9. Programme for rolling display of message "INDIAN".
10. To insert a number at correct place in a sorted array.
11. Serial and Parallel data transfer on output port 8155 & 8255 & designing of disco light, running light, and sequential lights on off by above hardware.
12. Generation of different waveform on 8253/ 8254 programmable timer.

06BEE202 POWER SYSTEM LAB

- 1 Study the burden effect on the performance of CT and measure ratio error.
- 2 Find out the sequence components of currents in three 1-Phase transformers and 3-Phase transformer and compare their results.
- 3 (i) Study over current relay.
(ii) Draw the current-time characteristic of an over current relay for TMS=1 & 0.5 and PSM=1.25 & 1.0.
- 4 (i) Study percentage bias differential relay.
(ii) Plot the characteristics of a percentage bias differential relay for 20%, 30% and 40% biasing.
- 5 Study gas actuated Buchholz relay.

06BEE203 MATLAB PROGRAMMING LAB

- 1 Basics of MATLAB matrices and vectors, matrix and array operations, Saving and loading data, plotting simple graphs, scripts and functions, Script files, Function files, Global Variables, Loops, Branches, Control flow, Advanced data objects, Multidimensional matrices, Structures, Applications in linear algebra curve fitting and interpolation. Numerical integration, Ordinary differential equation. (All contents is to be covered with tutorial sheets)
- 2 **Simulink:** Idea about simulink, problems based on simulink. (All contents is to be covered with tutorial sheets)

06BEE204 ADVANCED POWER ELECTRONICS LAB

- 1 Study and test AC voltage regulators using triac, antiparallel thyristors and triac & diac.
- 2 Study and test single phase PWM inverter.
- 3 Study and test buck, boost and buck- boost regulators. 4
Study and test MOSFET chopper.
- 5 Study and test Zero voltage switching.
- 6 Study and test SCR DC circuit breaker.
- 7 Control speed of a dc motor using a chopper and plot armature voltage versus speed characteristic.
- 8 Control speed of a single-phase induction motor using single phase AC voltage regulator.
- 9 (i) Study single-phase dual converter. (ii) Study speed control of dc motor using singlephase dual converter.
- 10 Study one, two and four quadrant choppers (DC-DC converters).
- 11 Study speed control of dc motor using one, two and four quadrant choppers. 12
Study single-phase cycloconverter.

B. TECH.
ELECTRICAL & ELECTRONICS ENGINEERING
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07BEE101 DATA BASE MANGEMENT SYSTEM

Unit-1 Introduction, need, purpose and goals of DBMS. DBMS Architecture, Concept of keys, Generalization and specialization, introduction to relational data model, ER modeling, concept of ER diagram.

Unit-2 **Database Design:** Conceptual Data Base design. Theory of normalization, Primitive and composite data types, concept of physical and logical databases, data abstraction and data independence, relational algebra and relational calculus.

Unit-3 SQL, DDL and DML. Constraints assertions, views database security. Application Development using SQL: Host Language interface, embedded SQL programming. GL's, Forms management and report writers. Stored procedures and triggers. Dynamic SQL, JDBC.

Unit-4 **Internal of RDBMS:** Physical data organization in sequential, indexed, random and hashed files. Inverted and multilist structures.

Unit-5 **(i) Transaction Management:** Transaction concept, transaction state, serializability, conflict erializability, view serializability. **(ii) Concurrency Control:** Lock based protocol. **(iii) Deadlock Handling:** Prevention detection, recovery. **(iv) Recovery System:** Log based recovery.

POWER SYSTEM ANALYSIS

07BEE102

Unit-1 (i) Percent and per unit quantities. Single line diagram for a balanced 3-phase system. **(ii) Admittance Model:** Branch and node admittances Equivalent admittance network and calculation of Y_{bus} . Modification of an existing Y_{bus} .

Unit-2 **(i) Impedance Model:** Bus admittance and impedance matrices. Thevenin's theorem and Z_b Direct determination of Z_{bus} . Modification of an existing bus. **(ii)**

Symmetrical fault Analysi Transient on a Transmission line, short circuit of a synchronous machine on no load, short circu of a loaded synchronous machine. Equivalent circuits of synchronous machine under su transient, transient and steady state conditions. Selection of circuit breakers, Algorithm for sho circuit studies. Analysis of 3 phase faults.

Unit-3 **(i) Symmetrical Components:** Fortescure theorem, symmetrical component transformation. Phase shift in star-delta transformers. Sequence Impedances of transmission lines, Synchronous Machine and Transformers, zero sequence network of transformers and transmission lines. Construction of sequence networks of power system.

(ii) Fault Analysis:

Analysis of single line to ground faults using symmetrical components, connection of

sequence networks under the fault condition.

Unit-4 Unsymmetrical Fault Analysis: (i) Analysis of line-to-line and double line to ground faults using symmetrical components, connection of sequence networks under fault conditions. (ii) Analysis of unsymmetrical shunt faults using bus impedance matrix method.

Unit-5 Load Flow Analysis: Load flow problem, development of load flow equations, bus classification. Gauss Seidel, Newton Raphson, decoupled and fast decoupled methods for load flow analysis. Comparison of load flow methods.

07BEE103 ARTIFICIAL INTELLIGENCE TECHNIQUES

Unit-1 Artificial Intelligence: Introduction to AI and knowledge based Expert systems: Introduction, Importance and Definition of AI, ES, ES building tools and shells.

Unit-2 Knowledge Representation: Concept of knowledge, Representation of knowledge using logics rules, frames. Procedural versus. Declarative knowledge, forward versus backward chaining. Control Strategies: -Concept of heuristic search, search techniques depth first search, Breadth first search, Generate & test hill climbing, best first search.

Unit-3 Artificial Neural Network: Biological Neurons and synapses, characteristics Artificial Neural Networks, types of activation functions. **Perceptions:** Perception representation, limitations of perceptrons. Single layer and multiplayer perceptrons. Perceptron learning algorithms.

Unit-4 Basic Concepts in Learning ANN: Supervised learning, Back propagation algorithm, unsupervised learning, Kohonen's top field network & Algorithm.

Unit-5 Fuzzy Logic: Fuzzy logic concepts, Fuzzy relation and membership functions, Defuzzification, Fuzzy controllers Genetic algorithm: concepts, coding, reproduction, crossover, mutation, scaling and fitness.

07BEE104 UTILIZATION OF ELECTRICAL POWER

Unit-1 (i) Electric Heating: Different methods of electric heating. Principle of high frequency induction and di-electric heating. Construction, operation, performance and application of arc furnace and induction furnace. **(ii) Electric Welding:** Welding process, welding transformer, Classification of Electric Welding: arc welding, resistance welding, welding of various metals.

Unit-2 Illuminations: Definitions, laws of illuminations, polar curves, luminous efficiency, photometer, incandescent lamps: filament materials, halogen lamp. electric discharge lamps: sodium vapour lamp mercury vapour lamp and fluorescent lamp. **Light Calculations:** commercial, industrial, street and flood lighting.

Unit-3 Electrolytic Process: Principles and applications of electrolysis, electrodeposition, manufactures of chemicals, anodizing, electro polishing electro-cleaning, electroextraction, electrorefining, electro-stripping (parting) power supplies for electrolytic process.

Unit-4 Electric Traction & Means of Supplying Power: Systems of Electric Traction: DC & AC Systems, Power Supply for Electric Traction System: Comparison and application of different systems. Sub-station equipment and layout, conductor rail & pantograph.

Unit-5 Traction Methods: Types of services, speed time and speed distance curves,

estimation of power and energy requirements, Mechanics of train movement. Co-efficient of adhesion, Adhesive weight, effective weight. **Traction Motor Controls:** DC and AC traction motors, Series parallel starting. Methods of electric braking of traction motors.

POWER SYSTEM ENGINEERING

07BEE105

Unit-1 Economic Operation of Power Systems: Introduction, system constraints, optimal operation of power systems. Input output, heat rate and incremental rate curves of thermal generating units. Economic distribution of load between generating units within a plant. Economic distribution of load between power stations, transmission loss equation. Introduction to unit commitment and dynamic programming.

Unit-2 Power System Stability -I: Power angle equations and power angle curves under steady state and transient conditions. Rotor dynamics and swing equation (solution of swing equation not included), synchronizing power coefficient. Introduction to steady state and dynamic stabilities, steady state stability limit.

Unit-3 Power System Stability-II: Introduction to transient stability. Equal area criterion and its application to transient stability studies under basic disturbances, critical clearing angle and critical clearing time. Factors affecting stability and methods to improve stability.

Unit-4 (i) Excitation Systems: Introduction of excitation systems of synchronous machines, types of excitation systems, Elements of various excitation systems and their control (functional block diagrams and their brief description)-DC excitation systems, AC excitation systems, brushless excitation system. **(ii) Interconnected Power Systems:** Introduction to isolated and interconnected powers systems. Reserve capacity of power stations, spinning and maintenance resaves. Advantages and problems of interconnected power systems. Power systems inter connection in India.

Unit-5 (i) Tap Changing transformer, phase angle control and phase shifting transformer. Series compensation of transmission lines, location and protection of series capacitors, advantages and problems. **(ii)** Introduction to power system security. **(iii)** Introduction to voltage stability.

07BEE106 DIGITAL SIGNAL PROCESSING

UNIT 1 : SAMPLING - Discrete time processing of Continuous-time signals, continuous-time processing of discrete-time signals, changing the sampling rate using discrete-time processing.

UNIT 2 : TRANSFORM ANALYSIS OF LTI SYSTEMS - Introduction, The frequency response of LTI systems, System functions for systems characterized by LCCD (Linear Constant Coefficient Difference) equations, All-pass system, MinimumPhase systems, Linear systems with linear phase.

UNIT 3 : STRUCTURES FOR DISCRETE-TIME SYSTEMS- Block diagram and signal flow graph representation of LCCD (LCCD - Linear Constant Coefficient Difference) equations, Basic structures for IIR and FIR systems, Transposed forms.

UNIT 4 : FILTER DESIGN TECHNIQUES - Introduction, Analog filter Design: Butterworth & Chebyshev. IIR filter design by impulse invariance & Bilinear transformation. Design of FIR filters by Windowing: Rectangular, Hanning, Hamming &

Kaiser.

UNIT 5 : The Discrete Fourier transform (DFT), Properties of the DFT, Linear Convolution using DFT. Efficient computation of the DFT: Decimation-in-Time and Decimation-in frequency FFT Algorithms. Processing of speech signals: Vocoders, linear predictive coders.

PRINCIPLES AND PRACTICE OF MANAGEMENT

Course/Paper: 07BMD101
B TECH+MBA Semester-VII

Objective:

This course provides the student with an understanding of how the philosophy of management underlies the B TECH+MBA course taught on the program. The objective of this paper is to familiarize the student with basic management concepts and behavioral processes in the organization. The course will be an introduction to the way in which a firm can develop its managerial thinking, mission and strategy. It will enable students to evaluate and analyze a firm's management.

Philosophy, to understand the impact this philosophy has on the organization and operation of the business.

Section A

Management an Overview, Management Defined, Functions of Management, Managerial Roles and responsibilities, System and Contingency Approach for understanding organizations, Management Thought-Classical Perspective, Scientific Management, Administrative Management, Bureaucratic Management, Behavioral Perspective. Managerial processes, functions, skills and rules in an organization, social responsibilities of Business.

Fundamentals of Planning - Objectives, Strategies, Policies, Decision-making.

Fundamentals of Organizing- Nature and purpose, departmentation, Span of Management, Strategic organizing design, line and staff authority and decentralization.

Direction-concept, Leadership- Meaning and Importance, transitions in leadership theories, trait theories, behavioral theories, contingency theories, leadership styles and skills, managerial culture and leadership. Coordination.

Control- concept, nature and purpose, control technique, control of overall performance, span of control.

Section-B

Case Study

References:

1. Management, Stonner, James & Others, Pearson Education N.D.
2. Management, Robbins & Coulter, Pearson Education N.D.
3. Principles of management, R.L. Nolakha , R.B.D. Jaipur
4. Principle of Management, Parthasarathy, Vrinda N.D.
5. Principle & practise of management, P.Subharao, Hari Shanker Pandey, Ramesh Book Depot
6. Management, G.S.Sudha, R.B.D. Jaipur

MANAGERIAL ECONOMICS

Course/Paper: 07BMD102
B TECH+MBA Semester-VII

Objective:

With economies becoming increasingly market oriented, it is becoming important for players in the market place to learn to conduct them in a manner that will assure them of success. The objective of the course is to provide insights into these aspects. Students of management must be exposed to the time tested tools and techniques of managerial economics to enable them to appreciate their relevance in decision-making.

Section-A

Nature and Scope of Managerial Economics, role and Responsibility of a Managerial Economist. The fundamental concepts of Managerial Economics, theory of the firm and the role of profits
Theory of Demand- concept, determinants of Demand, Demand Function and econometric techniques. Theory of Supply- concept, determination, analysis, supply function. Elasticity of Demand- concept, measurement. Concept of Consumer's surplus.
Analysis and costs estimation-economic Concept of Cost, Different Types of Cost: Managerial uses of cost Function; Production Function to cost function-long run and short run total cost, Break-even Analysis. Make or Buy Decisions.
Market structure and pricing decisions-the competitive and monopoly model, monopolistic competition and oligopoly, pricing of multiple products.
National income-concept and measurement. Business cycles, fiscal policy, Inflation. The new economy-definition and characteristics.

Section-B

Case study.

References:

1. Business Economics, Adhikary, manab, Excel books, N.D.
2. Economic Theory & Operation Analysis, Baumol, William J, N.D. PHI.
3. Business Economics, Agarwal & Deo, N.D. PHI.
4. Managerial Economics, D.N. Dwivedi, N.D. PHI.
5. Managerial Economics, Jhingen & Stephen, N.D. PHI.
6. Managerial Economics, Mote Others, N.D. PHI
7. Managerial Economics, Saraswat lodha, Ajmera Book depot.
8. Managerial Economics, Nair, Banerjee & Agarwal, Pragati Prakashan, Meerut.

INTERNATIONAL BUSINESS MANAGEMENT

Course/Paper: 07BMD103
B TECH+MBA Semester-VII

Objectives:

To develop an integrated understanding of International management aspects for devising and implementing Global management Strategies.

Section A

International business concept, nature, importance, dimensions, domestic and international business, process of internationalization-decision framework for internationalization. International trade theories, foreign direct investment theories, international business environment social, political, cultural and legal Globalization, rationalization: regional economic integration in Europe, NAFTA, role of regional and international institution: WTO, IMP, UNCTAD, SAARC in international trade, intellectual property in global business, role of WIPO.

Foreign exchange market, international monetary system

Method of entry in foreign markets, licensing, franchising, joint venture, subsidiaries, acquisition, strategic alliances, contract manufacturing.

International business: product decisions, market selection, distribution, promotion international pricing-factors, process and method, prerequisites. Transfer pricing, dumping, Control in international business: need objectives and approaches.

Section-B

Case Study

References:

1. International Business, K.Aswhappa, Tata McGraw Hill.
 2. International Business, Charles W L Hill, Arun K Jain, TataMcGraw Hill.
 3. International Management, Managing in a Diverse & Diverse & Dynamic Global Environment, Arvind V Phatak, Rabi S. Bhagat. Tata Mc Graw Hill.
 4. International Business, Donald Ball, Michael Geringer, Michael Minor, Tata Mc Graw Hill.
- International Business management, Pragati Agarwal, Pragati prakashan, , Meerut

07BEE201 DBMS LAB

- 1 Designing database and constraints using DDL statements.
- 2 Experiments for practicing SQL query execution on designed database. 3 Database connectivity using JDBC/ODBC.
- 4 Features of embedded SQL.
- 5 Designing front end in HLL and accessing data from backend database. 6 Designing simple projects using front end-back end programming.
- 7 Project for generating Electricity Bills
- 8 Project for managing student's attendance/marks details.

07BEE202 POWER SYSTEM MODELLING AND SIMULATION LAB

- 1 Simulate Swing Equation in Simulink (MATLAB)
- 2 Modelling of Synchronous Machine.
- 3 Modelling of Induction Machine.
- 4 Simulate simple circuits using Circuit Maker.
- 5 (a) Modelling of Synchronous Machine with PSS (b) Simulation of Synchronous Machine with FACTS device.
- 6 (a) Modelling of Synchronous Machine with FACTS device (b) Simulation of Synchronous Machine with FACTS devices.
- 7 FACTS Controller designs with FACT devices for SMIB system

B. TECH.

ELECTRICAL & ELECTRONICS ENGINEERING

VIII-SEMESTER

08BEE101 EHV AC/DC TRANSMISSION

Unit-1 **EHV AC Transmission:** Need of EHV transmission lines, power handling capacity and surge impedance loading. Problems of EHV transmission, bundled conductors: geometric mean radius of bundle, properties of bundle conductors. Electrostatic fields of EHV lines and their effects, corona effects: Corona loss, audio and radio noise.

Unit-2 **Load Frequency Control:** Introduction to control of active and reactive power flow, turbine speed governing system. Speed governing characteristic of generating unit and load sharing between parallel operating generators. **Method of Load Frequency Control:** Flat frequency, flat tie line and tie line load bias control. Automatic generation control (description of block diagram only).

Unit-3 **Voltage Control:** No load receiving end voltage and reactive power generation. Methods of voltage control. Synchronous phase modifier, shunt capacitors and reactors, saturable reactors, Thyristorised static VAR compensators- TCR, FC-TCR and TSCTCR.

Unit-4 **FACTS:** Introduction to FACTS controllers, types of FACTS controllers, Brief description of STATCOM, Thyristor controlled series capacitors and unified power flow controller.

Unit-5 **HVDC Transmission:** Types of D.C. links, advantages and disadvantages of HVDC transmission. Basic scheme and equipment of converter station. Ground return. Basic principles of DC link control and basic converter control characteristics. Application of HVDC transmission.

08BEE102 ELECTRIC DRIVES AND THEIR CONTROL

Unit-1 **Dynamics of Electric Drives:** Fundamental torque equations, speed-torque conventions and multi-quadrant operation, equivalent values of drive parameters, nature and classification of load torques, steady state stability, load equalization, close loop configurations of drives.

Unit-2 **DC Drives:** Speed torque curves, torque and power limitation in armature voltage and field control, Starting, **Braking-Regenerative Braking**, dynamic braking and plugging. **Speed Control-**Controlled Rectifier fed DC drives, Chopper Controlled DC drives.

Unit-3 **Induction Motor Drives-I:** Starting, **Braking-Regenerative braking**, plugging and dynamic braking. **Speed Control-**Stator voltage control, variable frequency control from voltage source, Voltage Source Inverter (VSI) Control.

Unit-4 **Induction Motor Drives-II:** Variable frequency control from current source, Current Source Inverter (CSI) Control, Cycloconverter Control, Static rotor resistance control, Slip Power Recovery- Stator Scherbius drive, Static Kramer drive.

Unit-5 **Synchronous Motor Drive:** Control of Synchronous Motor-Separately Controlled and VSI fed Self-Controlled Synchronous Motor Drives. Dynamic and Regenerative Braking of Synchronous Motor with VSI. Control of Synchronous Motor Using Current Source Inverter (CSI)

08BEE103 SWITCH GEAR & PROTECTION

Unit-1 (i) **Static Relays:** Introduction to static relays, merits and demerits.

Comparators: amplitude and phase comparators, duality between amplitude and phase comparators. Introduction to (a) amplitude comparators-circulating current type, phase splitting type and sampling type, (b) phase comparators-vector product type and coincidence type.

(ii) **Static over Current Relays:** Introduction to instantaneous, definite time, inverse time and directional overcurrent relays.

Unit-2 (i) **Static Differential Relays:** Brief description of static differential relay schemes-single phase and three phase schemes. Introduction to static differential protection of generator and transformer.

(ii) **Static Distance Relays:** Introduction to static impedance, reactance and mho relays.

Unit-3 (i) **Carrier Current Protection:** Basic apparatus and scheme of power line carrier system. Principle of operation of directional comparison and phase comparison carrier protection and, carrier assisted distance protection.

(ii) **Distance Protection:** Effect of power swings on the performance of distance protection. Out of step tripping and blocking relays, mho relay with blinders. Introduction to quadrilateral and elliptical relays.

Unit-4 **Circuit Breakers I:** Electric arc and its characteristics, arc interruption-high resistance interruption and current zero interruption. Arc interruption theories-recovery rate theory and energy balance theory. Restriking voltage and recovery voltage, develop expressions for restriking voltage and RRRV. Resistance switching, current chopping and interruption of capacitive current. Oil circuit breakers-bulk oil and minimum oil circuit breakers. Air circuit breakers.

Unit-5 (i) **Circuit Breakers II:** Air blast, SF₆ and vacuum circuit breakers. Selection of circuit breakers, rating of circuit breakers.

(ii) **Digital Protection:** Introduction to digital protection. Brief description of block diagram of digital relay. Introduction to digital overcurrent, transformer differential and transmission line distance protection.

08BEE104 NON-CONVENTIONAL ENERGY SOURCES

Unit-1 (i) Introduction: World energy situation, conventional and non-conventional energy sources, Indian energy scene.

(ii) Tidal Energy: Introduction to tidal power. Components of tidal power plants, double basin arrangement. Power generation. Advantages and limitations of tidal power generation. Prospects of tidal energy in India.

Unit-2 **Solar Energy:** Solar radiation, solar radiation geometry, solar radiation on tilted

surface. Solar energy collector. Flat- plate collector, concentrating collector - paraboloidal and heliostat. Solar pond. Basic solar power plant. Solar cell, solar cell array, basic photo-voltaic power generating system.

Unit-3 (i) Wind Energy: Basic principle of wind energy conversion, efficiency of conversion, site selection. Electric power generation-basic components, horizontal axis and vertical axis wind turbines, towers, generators, control and monitoring components. Basic electric generation schemes- constant speed constant frequency, variable speed constant frequency and variable speed variable frequency schemes. Applications of wind energy.

(ii) Geothermal Energy: Geothermal fields, estimates of geothermal power. Basic geothermal steam power plant, binary fluid geothermal power plant and geothermal preheat hybrid power plant. Advantages and disadvantages of geothermal energy. Applications of geothermal energy. Geothermal energy in India.

Unit-4 Nuclear Fusion Energy: Introduction, nuclear fission and nuclear fusion. Requirements for nuclear fusion. Plasma confinement - magnetic confinement and inertial confinement. Basic Tokamak reactor, laser fusion reactor. Advantages of nuclear fusion. Fusion hybrid and cold fusion.

Unit-5 Biomass Energy: Introduction, biomass categories, bio-fuels. Introduction to biomass conversion technologies. Biogas generation, basic biogas plants-fixed dome type, floating gasholder type, Deen Bandhu biogas plant, Pragati design biogas plant. Utilization of bio gas. Energy plantation. Pyrolysis scheme. Alternative liquid fuels - ethanol and methanol. Ethanol production.

HUMAN RESOURCE MANAGEMENT

Course/Paper: 08BMD101
B TECH+MBA Semester-VIII

Objective:

To become a successful manager of people, students need to understand behavior of human resources in various organizational situations. In a complex world of industry and business, organizational efficiency is largely dependent on the contribution made by the human resources of the organization. The objective of this course is to sensitize students to various facts of managing people and to create an understanding of the various policies and practices of human resource management.

Section-A

Human Resource Management-. Introduction and Scope, HRD-Concept, Need, Human Resource Planning-Concept, Process, job design-Concept approaches, job analysis, job description, job specification. Human Resource Procurement-Recruitment. Selection and induction.

Training, Training phases, Need Assessment, Establishment, Establishment of Training Objectives, Training method Lecture, case method, Role-playing. Business in Basket T- Group, Incident, Syndicate, Evaluation of a training Program. Performance measurement and reward systems-introduction, performance drivers, leadership and performance, reward management performance appraisals. Discipline. The grievance procedure.

Employee compensation-purpose and importance, components. non monetary rewards, workers participation in Management Employee. Strategic challenges for leadership, career management, SHRM Mergers and acquisitions.

Section-B

Case/Problems.

References:

1. Human Resource & Personal Management, Aswathappa K, TMH N.D.
2. Human Resource Management, L.M.Prasad, S.Chand
3. Human Resource Management, V.S.P.Rao, Excel books, N.D
4. International Human Resource management, Chris Brewster, University Press
5. Human Resource Management, Mizra S Saiyadain, Tata McGraw Hill.
6. Human Resource management, H.John Bernardin, Tata McGraw Hill

MARKETING MANAGEMENT

Course/Paper: 08BMD102
B TECH+MBA Semester-VIII

Objective:

Marketing is no longer a company department charged with a limited number of tasks- it is a company wide undertaking. It drives the company's vision, mission and strategic planning. Marketing succeeds only when all departments work together to achieve goals. The student will be able to understand these concepts.

Section-A

Understanding Marketing Management-Importance and scope. Marketing strategies and plans marketing and customer value. Marketing insights-information and scanning the environment, analyzing the macro environment. Rural Marketing: The profile of rural market of India. The main problem area in rural marketing, channel Management in rural markets, marketing communication in Rural Markets, Market Segmentation in rural market.

Consumer Behavior and market segmentation- Targeting and positioning as per the changing pattern of Indian consumers-levels of market segmentation, segmenting consumer markets, market targeting. Product Life Cycle Strategy, New Product Development Strategy.

Management of Marketing Efforts: building brands dealing with competition, competitive brand strategy. Product Policy and Pricing decision, Channels of distribution.

Managing the Marketing program-advertisement, sales promotion, direct marketing and Personal selling, interactive marketing (E-Marketing) Marketing Research and Information System.

Section-B

Case Study

References:

1. Marketing Management, Kotler Philip Keller.
2. Marketing Management Planning & Implementation, Ramaswamy & Namakumari,
3. Principle of Marketing, Kotler & Armstrong, Pearson Education N.D.
4. Marketing Management, Datta & Datta, Pearson Education N.D.
5. Marketing management, Kumar meenakshi, vikas publishing house.
6. Marketing management, kothari Sharma Mehta, RBD
7. Marketing management, P.K. Agarwal, Pragati prakashan, Meerut.

FINANCIAL MANAGEMENT

Course/Paper : 08BMD103
B TECH+MBA Semester-VIII

Objective:

The focus in this paper would be on issues related to financial management in the Indian Corporate Sector. The contents are related to the practices observed in Indian Corporate Sector. The objective is to enable and equip the manager with basic tools for applying financial analysis.

Section-A

Meaning, Importance and Objectives of Financial Management; Time value of money; Conflicts in profit versus value maximization principle; Functions of chief financial officer.

Risk and Return- overview of capital market theory, Beta Estimation, CAPM, and APT.

Management of working capital; Cash and Marketable securities management; Treasury Management, Receivables management, Inventory management, Financing of working capital.

Investment decisions: Capital budgeting- concept, theory. Cost of capital. Risk analysis in capital budgeting.

Financing decisions: Concepts of operating and financial leverage; Capital structure Theory and Policy; Dividend Policy. Different sources of finance: Asset Based financing- Lease, Hire Purchase and Project Financing. Corporate Restructuring, Merger and Acquisition.

Section-B

Case/Problems

Note: 50% of the question will be numerical.

References:

1. Principle of Corporate Finance, Brealy & Hyres, TMH N.D
2. Financial Management & policy, Horne James C. Van, TMH N.D
3. Financial Management, Khan Jain, TMH N.D
4. Financial Management, M.R.Agarwal, Garima Publication.
5. Financial Management, Prasan Chandra, Tata Mc graw hill.
6. Financial Management(Strategy Implementation & Control), Kapil Sheeba, Kapil K.N., Pragati Prakashan, Meerut.

MANAGEMENT INFORMATION SYSTEM

Course/Paper: 08BMD104
B TECH+MBA Semester-VIII

Objective:

The course is an introduction of computer architecture, networks and software tools. This will help students to understand the role of information systems and technology with current business and management application.

Section-A

Information & System Concepts-Introduction --Concepts, Classification of Information, Methods of Data & Information Collection, Value of Information, Organization and Information, System: A Definition. Types of Systems, System Decomposition, Integration of Sub Systems, Elements of a System, Human as an Information Processing System. International Business and IT.

Management Information System-MIS: Definition, Nature & Scope, MIS Characteristics, Functions, Structure of MIS, Role of MIS, MIS as a Control System, Process of Management, Application of MIS, ERP & IT's Benefits.

Internet-Introduction to Internet, Why We Need Internet, Internet Tools & Services, www, Internet in India, Security, Web Browser, Future of Internet, E-Comm. an Introduction, E-Business Fundamentals.

New Information Technology: Interconnection and networking, Multimedia, Neural Networks, Artificial Intelligence, Executive Information System, Decision Support System (DSS) and Expert Systems.

Issues for Senior Management: Management Control, Management Issues, Security Issues: Viruses, Worms and other creatures, I T issues for Management, Management in a Technological Environment, the changing world of Information.

Section-B

Case Study.

References:

1. Computer Fundamental Concepts & system, P. K. Sinha, BPB PUB. N.D.
2. Management Information System, Jawadekar, macgraw Hill, N.D.
3. Management Information System, Lucas, macgraw Hill, N.D.
4. Management Information System, Davis, TMH

5. Information System Solutions: A Project Approach, Van Horne.TMH
6. Management Information System , O'Brien, TMH
7. Management Information System, Haag, TMH.
8. Managemnet Information System, James O' Brain, Tata McGrawHill.
9. Managemnet Information System, Dharminder Kumar/Sunita, Excel Books, Delhi.
10. Managing With Information, Jerome Kanter, Prentise Hall Of India.
11. Management Information System: managing the digital firm, laudon & laudon, pearson education.
12. Information system for modern management, Murdick, Ross & Clagget, Prentice hall/pearson
13. Business Information System, Muneesh Kumar, Vikas Publishing house.

08BEE201 INDUSTRIAL ECONOMICS & MANAGEMENT

1 Money Banking and Trade: Functions of money, supply & demand for money, money price level & inflation, black money, meaning, magnitude & consequences. Functions of Commercial banks, banking system in India, shortcomings and improvements.. Function of RBI, monetary policy-making, objectives and features. Sources of public revenue, principles of taxation, direct and indirect taxes, Theory of international trade, balance of trade and payment, Foreign exchange control, devaluation
New economic policy: Liberalization, extending privatization, globalization.

2 Management Principles: Management functions, responsibilities of management to society, development of management thought. Nature of planning, decision making, management by objectives, Line and staff authority relationships, decentralization and delegation of authority, span of management,

3 Production Management: Production planning and control, inventory control, quality control and Total quality management. Tools of project management - CPM, PERT, project information systems. Marketing functions, management of sales and advertising marketing research.

4 Human Resource Management: Function, application of industrial psychology for selection, training and recruitment. Communication process, media channels and barriers to effective communication, theories of motivation, leadership.

5 Finance and Account Management: Engineering Economics: Investment decision, present worth, annual worth and rate of return methods. Payback time. Need for good cost accounting system, cost control techniques of financial control, financial statements, financial ratios, break-even analysis, budgeting and budgetary control.

08BEE202 ELECTRICAL DRIVES AND CONTROL LAB

- 1 Study and test the firing circuit of three phase half controlled bridge converter.
- 2 Study and obtain waveforms of 3 phase half controlled bridge converter with R and RL loads.
- 3 Study and test the firing circuit of 3-phase full controlled bridge converter.
- 4 Study and obtain waveforms of 3-phase full controlled bridge converter with R and RL loads.
- 5 Study and test 3-phase AC voltage regulator.
- 6 Control speed of dc motor using 3-phase half controlled bridge converter. Plot armature voltage versus speed characteristic.
- 7 Control speed of dc motor using 3-phase full controlled bridge converter. Plot armature voltage versus speed characteristic.
- 8 Control speed of a 3-phase induction motor in variable stator voltage mode using 3-phase AC voltage regulator.
- 9 Control speed of universal motor using AC voltage regulator. 10 Study 3-phase dual converter.
- 11 Study speed control of dc motor using 3-phase dual converter.
- 12 Study three-phase cycloconverter and speed control of synchronous motor using cycloconverter.
- 13 Control of 3-Phase Induction Motor in variable frequency V/f constant mode using 3-phase inverter.

BUSINESS POLICY AND STRATEGIC MANAGEMENT **(COMPULSORY PAPER)**

Course/Paper: 09BMD101
B TECH+MBA Semester-IX

Objective:

The objective of the course to equip the students with analytical tools for Cracking case studies by scanning the business environment and coming to a decision. The students will benefit by acquiring new ways and means of developing strategic decision-making skills.

Section-A

Business policy-evolution of the concept. Difference between business policy and strategic management. Corporate governance- concept, issues, models, evolution and significance. Introduction to Strategic Management-Concept importance of strategic Management, types of Strategy. Strategy & Competitive Advantage, Strategy Planning & Decisions, strategic Management Process.

Establishing company direction-developing strategic vision, setting objectives and crafting a strategy-Internal, Operating & External Environment, Formulating Long Term objective & Strategy, Strategic Analysis & Choice. Industry and competitive analysis, strategy and competitive advantage, Principles of Competitive Advantage-Identifying Value Activities,

Competitive Scope and the Value Chain, the Value Chain and Generic Strategies, Mergers & Acquisitions Strategies.
Strategy Implementation & Structure of strategy, Resource Management and Control, Ethics, Public Values & Social Responsibility
Strategy Evaluation & Control.

Section-B
Case Study.

References:

7. Strategic Management, P.K.Ghosh, S.Chand New Delhi.
 8. Business Policy & Strategic Management, Dr. S.S. Chawhan, Proff. B.K.Garg. ABD
 9. Business Policy & Strategic Management, Azahar Kazmi, TMH N.D..
 10. Strategic Planning Formulation of Corporate Strategy, Ramaswamy & Namakumari, Macmillian N.D.
 11. Business Policy & Strategic Planning, Tauch & Glueck, Frank Bros & Co
 12. Cases in Strategic Management, Amita Mital, Tata Mc Graw Hill.
 13. Cases in Strategic Management, Budhiraja, Tata Mc Graw Hill.
- Business policy & Strategic Management, Nair, Banerjee & Agarwal, Pragati prakashan

OPERATIONS AND PRODUCTION MANAGEMENT

Course/Paper: 09BMD102
B TECH+MBA Semester-IX

Objective:

The Course is designed to acquaint the students with decision making in: Planning, scheduling and control of Production and Operation functions in both manufacturing and services; Productivity improvement in operations thought layout engineering and quality management etc; Effective and efficient flow, replenishment and control of materials with reference to both manufacturing and services organizations.

Section-A

Operation Management-Introduction. Operation Research and operation strategy, forecasting demand and Linear regression, transportation and assignment problems, allocation of resources. Nature and Scope of Production Management- process planning and design Facility Location; Types Manufacturing Systems & Layouts; Layout Planning and Analysis Material Handling- Principals-Equipments, Line Balancing-Problems Operations decisions-Production Planning and Control -In Mass Production in Batch/Job Order Manufacturing.

Capacity Planning -Models, Process Planning-Aggregate Planning-Scheduling Maintenance Management Concepts-Work Study, Method Study, Work Measurement, Work Sampling Work Environment-Industrial Safety; Computer aided Manufacturing (CAM), Artificial Intelligence & expert systems.

Material Management -an Overview, production control, storage and retrieval System. Inventory Control- JIT. Network Techniques-Simulation Concept of total Quality (TQ). International Quality Certification and other standards and their applicability in design manufacturing Humanistic and Marketing Aspects of TQ. Total Quality of services. Total Quality and safety. ERP and Business process engineering maintenance Management, project management-PERT & CPM.

Section-B

Case study.

References:

1. Operation Research : Introduction, Taha, Handy A, Delhi, Pearson Education
2. Operation Research - Theory & Applications, J.K.Sharma, Macmillian India Ltd. N.D
3. Production & operation management, S.N.Chary, TMH
4. Production & operation management, Ranjit Singh, Jaipur Publishing.
5. Operation & production Management, K. Aswathapa, Himalaya publication.
6. Operation Research, S.D. Sharma, Kedar Nath & Ram Nath.
7. Production & Operation Management, Nair, Banerjee & Agarwal., Pragati prakashan.

RESEARCH METHODS IN MANAGEMENT

Course/Paper: 09BMD103
B TECH+MBA Semester-IX

Objective:

The objective of the course is to enable the students, in developing the most appropriate Methodology for their research studies and to make familiar with the art of using different research methods and techniques. To understand the concept and process of Business research in business environment. To know the use of tools and techniques for exploratory, conclusive and causal research. To understand the concept of measurement in empirical systems & its validity and reliability. To use statistical Techniques for analysis of research data. To realize the applications of Business research

Section –A

Concept of Scientific Enquiry - Formulation of Research Problem Hypothesis Building Characteristic and Testing, Review of Literature, Research Design-Exploratory, Descriptive and Experimental research Design. Qualitative Research Design. Data Collection -Sources, Constructing a questionnaire. The Interview, Observation and Survey. Sampling Decisions, Probability and Sampling.

Parametric and Nonparametric test, level of Significance, using software for analysis Grouping and displaying data to convey meaning: Tables and Graphs, measures of Central tendency and dispersion in frequency distributions, Probability distributions, and Testing hypotheses One sample test and two sample tests, chi-square and analysis of variance, Simple regression and correlation, Non-Parametric methods - the sign test for paired data, the rank sums test. The mann-whitney U test, the one sample Runs test, rank correlation.

Attitude Measurement- Motivational Research, Focus Group; Scaling Techniques- Socio Metric and Rating Scale, Scalograms, Internal Consistency Scales. Report Writing Organization Presentation, Bibliography and References.

Section-B

Cases and Problems.

References:

1. Business Research Method, Cooper Schindler, TMH
2. Research Methodology, C.R.Khothari, New Age Publisher
3. Marketing Research, Beri, TMH
4. Research Methods, Susmit Jain.
5. Marketing Research – Text & Cases, Nargundkar, TMH.
6. Marketing Research within a changing, Hair, TMH.

7. Research Methods For Business: A Skill Building Approach, Sekaran, Wiley, India.

14. .

SUMMER TRAINING PROJECT REPORT

(COMPULSORY MAJOR PAPER I)

Course/Paper: 09BMD104
B TECH+MBA Semester-IX

Objective:

The summer training project report will be evaluated on internal and external basis. Evaluation and presentation of the report will be done by internal and external Examiners. The student will submit written report and make an oral presentation before a panel of internal examiner (Director/ principal of the institute or his or her nominee) and external examiner (to be appointed by director/principal of the institute from a panel proposed by the board of studies and approved by the vice chancellor of BU.) The assessment of the report and its presentation will be jointly done by the internal and external examiner.

GROUP A - FINANCE

INTERNATIONAL FINANCIAL MANAGEMENT

Course/Paper:09BMD105
B TECH+MBA Semester-IX

Objective:

The new economic environment has changed the total concept of business in the country. Financial markets of the world are increasingly integrating. Financial opportunities have increased manifold across markets. Almost all products and services face global competition. To introduce the environment of international finance and its implications on international business. To explore the sources of long term finance and design financial strategies. To integrate the global developments with the changing business environment in India.

Section A

International financial management: Genesis international flow of funds. Developments in international monetary system, Emergence of multinational financial management.

Balance of payment. Risk: political and country risk. Raising capital: Domestic & International Introduction of Financial Management: Functions, Profit V/S Wealth Principle, Foreign Direct Investment.

Parity conditions in International Finance- Purchasing Power Parity, Covered Interest Parity, Real Interest Parity, Parity Conditions and Managerial Implications. Analysis of International Capital Budgeting, Cost of Capital of a Foreign Investment, International financing and investment strategies, managing short term assets and liabilities. Country Risk Analysis.

Section B

Case and Problems

References:

1. Multinational Financial Management, Shapiro, PHI N.D.
2. International Financial management, Madhu vij, Excel books, N.D.
3. International Finance, Thomas J. O'Brien.
4. International Financial Management, Apte, Tata Mc Graw Hill.
5. International Financial Management, Eun, Tata McGraw Hill.

GROUP B - MARKETING

INTERNATIONAL MARKETING

Course/Paper:09BMD106
B TECH+MBA Semester-IX

Objectives:

To develop an integrated understanding of International marketing aspects for devising and implementing Global Marketing Strategies.

Section A

An Overview to International Business and Trade Theories - Introduction to Marketing Communication, Free Trade v/s Protection, Classical, Modern Theories, Gain and Terms of Trade.

International Business Management - The Economic Environment, Social & Cultural, Political Legal and Regulatory Environment, Competitive Advantage in Global Environment, Market Entry Expansion and Partnership.

International Finance & Institutional Systems - Foreign exchange, Balance of payments, Importing and Exporting, Trade Blocks, International Monetary Fund & World Bank, The Triad and other manner.

Strategic issue for international Marketing - Marketing Information System & Research, Segmentation, Targeting & Positioning, Planning process.

International Marketing Mix Elements - Product Decisions, Pricing Decisions, Marketing channel & place Decision Promotion decisions, Organizing & Controlling.

Section B

Case and Problems

References:

1. International Marketing, Yuvraj
2. International marketing, Kothari, Jain, Rbd.
3. International Marketing, Cateora, Tata Mc Graw Hill.
4. Global Marketing, Johansson, Tata Mc Graw Hill.
5. International Marketing, Paul, Tata Mc Graw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

STRATEGIC HUMAN RESOURCE MANAGEMENT

Course/Paper:09BMD107
B TECH+MBA Semester-IX

Objectives:

The purpose of this course is to Understand Strategic HRM, Aligning HR systems with business strategy, Strategy formulation, Strategies for performance and development with knowledge of global economy factors. The score card approach is also gaining its importance.

Section A

Understanding Strategic HRM: Traditional vs. strategic HR, Typology of HR activities, “best fit” approach vs. “best practice” approach, HR strategy and the role of national context, and organizational context on HR strategy and practices, investment perspective of human resources. Aligning HR systems with business strategy: Sustained competitive advantage - how HR adds value to the firm - HR as scarce resource – non-substitutable resource, linking HRM practices to organizational outcomes – assessing and reducing costs – behavioral impact of HR practices – linking strategy to HRM practices – corporate HR philosophy and company wide HR standards – HRM leading strategy formulation.

HR Strategy in work force utilization: Efficient utilization of human resource – cross training and flexible work assignment – work teams – non unionization, strategies for employee shortages, strategies for employee surpluses. Strategies for performance and development: Typology of performance types – marginal performers – under achievers – stars – solid citizens, managing employee ability – recruitment and selection strategy typology, incentive alignment, psychological contracting.

Evaluating HR Function: Overview of evaluation – scope – strategic impact – level of analysis – criteria – level of constituents – ethical dimensions, quantitative and qualitative measures – outcome and process criteria, balanced score card perspective, bench marking, accounting for HRM – purpose of measuring cost and benefits of HRM – approaches to HRM performances – employee wastage and turn over rates – cost of absenteeism – measuring human resource cost.

Section B**Case and Problem****References:**

1. Strategic Human Resource Management, Rajiv Lochandhar, Excel books, N.D.
2. Human Resource Strategy A Behavioral perspective for the general Manager, George Dreher, Thomas w Dougherty. Tata Mc Graw Hill.
3. Human Resource Strategy, James W Walker, Tata Mc Graw Hill.
4. Human Resource strategy, Dreher, Tata Mc Graw Hill.
5. Strategic Human Resource: Frameworks for general managers, Baron,Wiley India.
6. Strategic Human Resource management, Schuler, Wiley India.

GROUP A - FINANCE

INVESTMENT MANAGEMENT & SECURITY ANALYSIS

Course/Paper: 09BMD108
B TECH+MBA Semester-IX

Objective:

The focus of Security Analysis is on how others analyze your company's securities on their own. Whereas, that of Portfolio Management is on how investors analyze your company's securities in comparison with other's on the security market. The course is designed with a view: _To acquaint the students with the working of security market and principles of security analysis; and _To develop the skills required for portfolio management so as to be able to judge the competitive position of firms in capital market and review the related business decisions.

Section A

The Role of Security Markets in Economy. The Organization and Mechanics of Indian Security Markets- Various Securities and their Characteristics, Objective of the Security Analysis, functions of an Organized Security Market, Mechanics of Security Trading.

Various Types of Security Markets and their Functions- Stock Exchanges, Depository. Role of SEBI with regard to Secondary Markets. Capital asset pricing model, arbitrage pricing theory, efficient market hypothesis, technical and fundamental analysis. Concept and trends of savings and investment in India. Stock market: concept, functions, regulations, working and reforms. Instruments of mobilizing investment: Types and characteristics. Comparison of investment options. IPO and secondary markets: reforms and trends, trading mechanism: on line trading, settlement period. Transaction cost in secondary markets, clearing settlement and depositories, integration of stock exchange and consolidation of intermediaries, listing requirements.

Section B

Case and Problems

References:

1. Investment Management & portfolio management, V.K. Bhalla,
2. Security Analysis & portfolio Mgmt., Punithavan Pandian
3. Security Analysis & Investment Management M.R.Agarwal, Garima Publication.
4. Investment Managemnet, Aswathappa, Himalaya Publication.
5. Investment : An Indian Perspective, Bodie & Mohanty
6. Investment : Analysis & Behaviour, Hirschey, Tata McGraw Hill.

GROUP B - MARKETING

ADVERTISING MANAGEMENT

Course/Paper: 09BMD109
B TECH+MBA Semester-IX

Objectives:

The objective of this course is to develop the understanding about the marketing communication tools and implement them in designing Advertisement strategies.

Section A

Introduction of Marketing Communication-Overview of marketing communication, Factors affecting the marketing communication mix, Integrated Marketing Communication, Ethical issues in marketing communication. Marketing Communication Planning-Models of marketing communication, Developing & control of marketing communication, marketing communication-planning procedure. Advertising objectives and planning - Meaning Definition and objectives of Advertising, Types of advertising, The advertising agency: Function & types, Advertising Agency compensation Creative strategy - Target market & creative objective, advertising Appeals, Creative format & creation stage, Copy testing and diagnosis.

Media planning & promotion - Environment analysis media object, Media strategy & media planning modes, Indoor media, out door media, Measuring Advertisement Performances, Current developments in advertising.

Section B

Case and Problems

References:

1. Advertisement Management, Batra & others, PHI N.D.
2. Advertisement Management(In Indian Perspective), P.K.Agarwal, Pragati Prakashan.
3. Advertising Sales Promotion & CRM , P.K.Agarwal, Pragati Prakashan.
4. Advertisement Management: Concepts & Cases, Mohan, Tata Mc Graw Hill.
5. Advertising & Promotion, Belch, Tata McGraw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

TRAINING AND DEVELOPMENT

Course/Paper: 09BMD110
B TECH+MBA Semester-IX

Objective:

The Purpose of this paper is to provide an in-depth understanding of the role of training in the HRD and to enable the course participants to manage the Training system and processes.

Section A

Introduction to Training & Development - Training and Training needs Assessment, Training Design and Administration, Training methods, Technique & Aids, Training Strategy Performance Appraisal & Training - Learning through training, Adult Learning (Andragogy), Learning theories and learning Curve, Learning Styles

Training Process: An Overview; Role Responsibility and Challenges to Training Managers; Organization and Management of Training Function; Training Needs Assessment and Action Research; Instruction Objectives and Lesson Planning; Learning Process; Training Climate and Pedagogy; Developing Training Modules.

Trainer & Training Institutions - Trainers Profile, Types of Training Institutions, Trainer as a change Agent, MDP.

Evaluation of Training - Training evaluation & ROI, Trainer of Training, Measurement Tools & Technique, Feedback Mechanism Training Methods and Techniques: Facilities Planning and Training Aids; Organizing the training Department, controlling training, Training Communication; Training Evaluation;
Training and Development in India.

Section –B

Case Study.

References:

1. Training Instruments for HRD & O.D., Udai Pareek, Tata Mc Graw Hill.
2. Employee Training & Development, Raymond A Noe, The Ohio State University, Tata Mc Graw Hill.
3. Training in Practise, Stephen Truelove, Tata Mc Graw Hill.
4. Employee Training & Development, Noe, Tata McGrawHill
5. Training & Development, Janakiram, Wiley India.

SOCIAL RESPONSIBILITY & BUSINESS ETHICS & LAW

Course/Paper: 10BMD101

B TECH+MBA Semester-X

Objective:

This course aims at helping students think about some of the important ethical Implications of the day-to-day happenings and practices of Indian industry and business. It is designed to stimulate discussion and debate rather than to formulate principles, and to raise further questions rather than to dictate answers. The following objectives are underlined: To improve ethical reasoning by correlating moral concepts to business practices - clarification of the values that determine managerial behavior To sensitize the fundamental human values in analyzing social problems and appraising global issues. To recognize the variables in most ethically complex business situations through an understanding of the more subtle criteria for making sound decisions.

Section- A

The Concept: The dream of an Indian Style of Management, Abiding Values is Universal, Individualistic: Rational Brain Vs Holistic-Spiritual Brain. Total Quality Mind for Total Quality Management: The Imperative of Human Values. Group Ethics- Ethical Attitudes of Indian Managers, Managers Facing Unethical Management,

Ethics & the Organization: Unity: The Basis of Ethics, Science & Ethics, Technology & Ethics, Business Ethics, Normative Ethics, Managing Ethics, Cooperative Ethics, Indian Ethos for Management.

Relevance of Gita to Modern Management.

Business Law

Indian Contract Act, 1872-Essential Elements of Contract, Void Agreements; Breach of Contracts & Remedies, Amendments. Negotiable Instruments. Act, 1881-Promissory Notes, Cheques, Bills of Exchange Sale of Goods Act, 1930-Contract of Sale, Transfer of Property; Sale by Non-Owner, Performance of Contract. Indian Company's Act, 1956-Meaning and Nature of Company, Kinds of companies, Registration and Incorporation, Share and Share Capital.

Section –B

Case study

References:

15. Business Ethics & Indian ethos, Dr. G.N. Purohit Dr. Gaurav Bissa, Ajmera Book depot.
16. Business Law & regulatory framework, Dr. S.S. Chawhan & Mohit Sharma, ABD..
17. Business law, Dr. R.L. Nolakha, Ramesh Bk Depot
18. Company law, S.S. Gulshan, Excel Books.
19. Business Ethics, Ronald D Francis, Mukti Mishra, Tata Mc Graw Hill.
20. Perspectives of Business Ethics, Laura Hartman & Abha Chatterjee. , Tata Mc Graw Hill.
21. An Introduction to Business Ethics, Joseph Des Jardins, Tata Mc Graw Hill.
22. Indian Ethos & Values of Managers, Khandelwal N.M., Pragati Prakashan

Project Management

Course/Paper: 10BMD102
B TECH+MBA Semester-X

GROUP A – FINANCE

MANAGEMENT OF FINANCIAL SERVICES

Course/Paper: 10BMD103
B TECH+MBA Semester-X

Objective:

In The Fast Changing Scenario of the Indian Economy, With Deregulation, Competition, Free Market Orientation, And Globalization flows And Outflows of Funds Increased and the FFIs and FII's have started operations in the Indian financial markets. This course shall enable the student to look into the various perspectives and understand the importance.

Section A

Introduction to financial services marketing: Concept of financial services, financial services and GDP, reforms in financial sector, recent issues and challenges in financial services in India. Indian financial system: an overview of Indian financial institutions, types of financial services – fund and fee based. An overview of the different activities performed by a bank. Risk in financial services and changing perception of intermediaries regarding financial services.

Capital markets: government securities market, monetary money market.

Merchant banking: nature and scope, regulation, overview of current Indian merchant banking scene-structure of merchant banking industry, primary market in India and abroad, SEBI guidelines, pricing and timing of public issues, pre-issue management-advertising and marketing, post issue management-rights issues.

Introductory, conceptual, evaluation, marketing and legal aspects of the following financial services: Lease, Hire purchase, consumer finance, factoring, bill financing, credit cards.

Section B

Case and Problems

ReferencEs:

1. Financial Markets & Services, Gorden Natrajen, Himalaya Publication
2. Marketing of Fianacial Services, jain rathi thakur solanki, RBD, jaipur.
3. Financial Services, tripathy, PHI.
4. Financial Institutions & markets, kohn, oxford.
5. Financial markets & financial services, vasant desai, Himalaya publication.

GROUP B - MARKETING

SALES & DISTRIBUTION MANAGEMENT

Course/Paper: 10BMD104

B TECH+MBA Semester-X

Objectives:

To provide an understanding of the concepts, attitudes, techniques and approaches required for effective decision making in the areas of Sales and Distribution. To pay special emphasis on the practicing manager's problems and dilemmas. To develop skills critical for generating, evaluating and selecting sales and distribution strategies.

Section A

The Sales Management - Introduction to sales management and sales organization, Sales function & policies, Personal selling - nature, scope & objectives, Formulating Personal selling strategy.

Planning the Sales Effort - Sales planning and Budgeting, Estimating Market Potential and Sales forecasting, Setting the sales territory & quotas, Sales and cost Analysis.

Organizing and Directing the sales Force - Recurring and training sales personnel, Designing & compensating sales Personnel, Motivating and Leading the sales force, Evaluating sales force performance.

Distribution Management - Managing marketing logistics & channels, Channel Integration - VMS, HMS, Channel Management, and Marketing channel Policies & legal issue.

Channel Institutions & control, Wholesaling &- Retailing, Channel Information systems, Managing & Evaluating Channel Performance Case & future trends in sales & distribution management.

Section B

Case and Problems

References:

1. Sales Management, Still & Cundiff, Pearson Pentrice Hall.
2. Sales & Distribution Management, Hawalder, TMH.
3. Sales & Distribution Management, Panda.
4. Sales & Distribution Management, G.S. Sudha. RBD.
5. Sales & Distribution Management, Nair, Banerjee & Agarwal, Pragati Prakashan.
6. Sales & Distribution Management, P.K. Agarwal, Pragati Prakashan.

GROUP C - HUMAN RESOURCE MANAGEMENT

LEADERSHIP SKILLS AND CHANGE MANAGEMENT

Course/Paper: 10BMD105
B TECH+MBA Semester-X

Objectives:

The course will let the student understand the impact and importance of becoming a leader, effective leadership behaviour and styles. Understanding the change, its role and implementation

Section A

The nature and importance of leadership: The meaning of leadership – leadership as a partnership – leadership vs. management – the Impact of leadership on organizational performance – leadership roles – the satisfactions and frustrations of being a leader. Traits, Motives, and characteristics of leaders: Personality traits of effective leaders' leadership motives-cognitive factors and leadership.

Effective leadership behaviour and attitudes: task-related attitudes and behaviours – relationship-oriented attitudes and behaviours – super leadership: leading others to lead themselves – 360-degree feedback for fine-tuning leadership approach.

Leadership styles: the leadership continuum: classical leadership styles – the boss-centered vs. employee-centered leadership continuum – the autocratic participative free rein continuum- the leadership grid styles – the entrepreneurial leadership style – gender differences in leadership style – selecting the best leadership style.

Understanding change: nature of change – forces of change – perspective on change: contingency perspective – population ecology perspective institutional perspective – resource-dependence perspective

Types of change: continuous change – discontinuous change – participative change – directive change. Implementing change: assemble a change management team – establish a new direction for change – prepare the organization for change ,systems and resources to support change – identify and to remove road blocks to change – absorb change into the culture of the organization

Section B

Case and Problems

References:

1. Leadership: Enhancing The Lessons of Experience, Richard L Hugues, Robert c Ginnette, Gordon J Curphy, Tata McGraw Hill.
2. Leaders & the leadership process, Jon Pierce & John Newstorm, Tata McGraw Hill.
3. Art of Leadership, George Manning, Kent Curtis, Tata McGraw Hill.
4. Leadership, Hughes, tata Mc Graw Hill
5. Leadership Research Findings, Practise & Skills, DuBrin, Wiley India.
6. Practising Leadership Principles & Applications, Shriberg, Wiley, India.

GROUP A – FINANCE

FINANCE FOR STRATEGIC DECISIONS

Course/Paper: 10BMD106
B TECH+MBA Semester-X

Objective:

The modern industrial or service firm must conduct its business in a rapidly changing and highly competitive environment. A premium is placed on the ability to react quickly and correctly to constantly changing market conditions. The objective of the course is to make student aware of the strategic decisions to be undertaken to familiarize with finance function.

Section A

An Overview of the Financial System- Saving and Investment, Money, Inflation & Interest, Banking and Non Banking Financial Intermediaries.

Financial Markets and Instruments- Money market and Capital Markets, Financial Instruments: REPO, Equities, Bonds, Derivatives etc. Characteristics of Financial Instruments:

Central Banking, Monetary Policy & Regulation- The RBI as a Central Bank: Structure, Functions and Working, Reforms, the Current Regulatory Structure. Concept of strategic decisions-changing global economic environment. Theory of Merger & Acquisition. Strategic decisions regarding securitization factoring and forfeiting,

Section B

Case and Problems

References:

1. Finance for Strategic Decision, Jain & Rathi, RBD.
2. Financial Markets & Corporate Strategy, Grinblatt, Tata McGraw Hill.
3. Capital Markets, GuruSamy, TataMc Graw Hill.
4. Financial Services, Guruswamy, Tata McGraw Hill.

GROUP B - MARKETING

PRODUCT & BRAND MANAGEMENT

Course/Paper: 10BMD107

B TECH+MBA Semester-X

Objectives:

To help the students appreciate the relationship between Corporate Strategy and Product and Brand Management. To equip the students with the various dimensions of product management such as product-line decisions, product platform and product life cycle. To provide a framework to understand the new product development process, the organizational structures for new product development and product management functions within an organization-To explore the various issues related to Brand Management and to enhance the understanding and appreciation of this important intangible strategic asset including brand associations, brand identity, brand architecture, leveraging brand assets, brand portfolio management etc.

Section A

Introduction to Product Management - What is Product & Product - Service Continuum, Individual Product Decisions, Product attributes, Product and product Lives, Special issues in Product Management - Product Life cycle & Strategy, Product Differentiation, New Product development.

Introduction to Brand Management and Crafting of Brand Elements. Consumer Brand Knowledge. Brand Identity, Personality and Brand Associations. Managing Brand Architecture and Brand Portfolios. Corporate Branding and Tools for Building Brand Equity. Leveraging Brand Equity. Measurement of Brand Equity.

Brand as a Concept - Value & Significance of Brand, Brand Name, Symbol & Slogan, Brand Strategic Decision, Line Expensing & Brand Extension

Concept of Brand Equity & Association - Brand Loyalty; Awareness, Creating and Managing Brand Equity, Selecting, Creating and Maintain Associate.

Brand Strategic - Brand Rejuvenation, Brand Relations, Brand Proliferation, Multi Branding, Global Brand.

Section B

Case and Problems

References:

1. Managing Indian Brands, Ramesh Kumar, Vikas Pub. N.D.
2. Product & Brand Management, Sharma Pareek, Ramesh Book Depot.
3. Product Development & Design, tarun soota, Pragati Prakashan.
4. Product Management, Anandan, Tata Mc Graw Hill.
5. Product Management, Lehmann, tata mc graw hill.
6. Product Design & Development, Ulrich, Tata Mc Graw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

HUMAN RESOURCE PLANNING

Course/Paper: 10BMD108
B TECH+MBA Semester-X

Objectives:

To understand the purpose, process and applications of human resource planning in the context of different organizational strategies. To create a critical appreciation and knowledge of understanding the determinants of human resource requirements. And the means for meeting those requirements. To create practical awareness about the current trends in human resource planning in global companies.

Section A

Introduction: definition and concept of HRP, benefits, process. HRP components.

HR planning and corporate strategies: HR planning as a strategic process-employees as resources-goal attainment, linking HR process to strategy, involvement in strategic planning process, strategic HR Planning model, staffing system.

Job analysis: meaning and definition, job analysis process, techniques of job analysis, methods and practice of job analysis, competency based approach.

HR Forecasting: Forecasting Manpower Needs, the Forecasting Process, Inventorying available talent, Projecting Future Talent Supply, forecasting Staffing Requirements. Index analysis-expert forecasts-delphi technique-nominal group technique-HR budget and staffing table, scenario forecasting, regression analysis.

Career planning and succession management: definitions, concepts, stages of career development process and organizational HR Policies, career processes Succession management process and Management development programmes, objectives of MDP's, Job rotation, Auditing MDP's management development methods, challenges of succession management, Replacement analysis.

Section B

Case and Problems

GROUP A – FINANCE

BANKING SERVICES & OPERATION

Course/Paper: 10BMD109
B TECH+MBA Semester-X

Objective:

The objective of the course is to develop the skills required for understanding India's most challenging and important financial services sector. Banking services operation will enable the management student to have an insight to the banking sector and how it works.

Section A

Indian financial system: the financial system – nature – evolution and structure – the functions of financial intermediaries – financial instruments – the role of financial system in economic development the Indian financial system.

Deposit products: types of bank deposits, deposit schemes, composition of bank deposits. Credit policy: Need for credit policy, credit policy components of credit policy, credit policy pursued by the government. Retail banking: basics of retail banking, forms of retail banking. Corporate banking: The nature of corporate banking, loan syndication.

Rural banking and Micro finance: sources of rural finance, credit delivery mechanism in rural finance to co-operative agricultural and rural development banks (CARDB) – regional rural banks (RRBS), service area approach (SAA) – National Bank for Agriculture and Rural Development (NABARD), microfinance.

Fee-based services: the fee-based services of banks, letter of credits, bank guarantees.

Introduction to banking operations: Importance of customer relationship management in banks – different types of products and services offered to customers – role of technology in banking operations Introduction to electronic banking.

Section B

Case and Problems

References:

1. Banking Service & Operation, Jain & Rathi Sharma, RBD, Jaipur.
2. Banking theory Law & Practise, Gurusamy, Tata Mc Graw Hill.
3. Merchant Banking & Financial services, Gurusamy, Tata Mcgraw Hill.
4. Banking & Financial System, B.L.Ojha, Ajmera Book Company.
5. Financial Services, M.Y.Khan, Tata Mc Graw Hill.

GROUP B - MARKETING**MARKETING OF SERVICES**

Course/Paper: 10BMD110
B TECH+MBA Semester-X

Objectives:

Planning and implementing the marketing strategy for service products requires a different sort of approach, which is different from the traditional goods marketing. The objective of this course is to acquaint the students to the uniqueness of the services characteristics and its marketing implications. The intent of the course is to discuss measure and analyze several facets in the area of services marketing essential for the success of a service sector firm.

Section A

Introduction to Service Marketing - Understanding Service, The Nature of Service Marketing, Classification of service. Service Consumer Behavior - Understanding Consumer Behaviors, Customer expectations & perceptions, managing & exceeding customer service exportations, Strategic for influencing customer perception.

Strategic Issues in Services Marketing - Market Segmentation & Targeting; Individualized Service and Mass Customization, Differentiation and Positioning of Services; Steps in developing a positioning strategy, Developing and maintaining demand & capacity.

The marketing mix and services - The marketing mix elements, Traditional marketing mix - Product, price place, promotion & communication services, extended marketing mix – people, process physical evidence in services.

Challenges of service marketing - Developing & managing the customer service function, Marketing planning for service; Developing & maintain quality in services, Relationship marketing, Service marketing - specific Industries, Tourism, Travel, Transportation service marketing, financial services; Education & Professional service, Telecom & Courier, Media Service.

Section B

Case and Problems

References:

1. Service marketing, Lovelock, Pearson Education N.D.
2. Services Marketing: Text & Cases, Nargundkar, Tata Mc Graw Hill.
3. Service Marketing, Zeithaml, Tata Mc Graw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

PERFORMANCE MANAGEMENT & RETENTION STRATEGIES

Course/Paper: 10BMD111
B TECH+MBA Semester-X

Objectives:

The objective of this paper is to introduce the basic concept of performance management and to widen the knowledge of the students in selecting and implementing the various performance measurement methods for better designing of reward system associated with it.

Section A

Performance Appraisal – A Conceptual Framework, Concept & Definitions of performance appraisal, and Objectives of performance appraisal: Process of performance appraisal, Performance Appraisal v/s Performance Management System, Concept of performance management, Process & elements Of performance management.

Behavioral Performance Management - Learning Theories; Principles of Learning: Reinforcement and Punishment, Role of Organizational Reward Systems, Behavioral Performance Management or OB Mod.

Potential Appraisal & HRD - Meaning & objectives of Potential Appraisal, Potential Appraisal & Performance Appraisal, Concept of HRD; Objectives and challenges of HRD Mechanisms and HRD outcomes.

Performance Planning & Measuring Performance - Meaning & need of Performance Planning, Planning Individual Performance, Principles of Measurement.; Classification of Performance Measures, Measurement issues; Approaches & tools to measure organizational performance, Traditional and modern performance appraisal methods

Competency Analysis and Competency Mapping - Meaning of competency, Competency Analysis and Approaches to competency Analysis, Competency mapping; Need development and assessment of competency models, Competency and performance, Tools to identify the competencies of the employees.

Section B

Case and Problems

References:

1. Performance management, Dixit Varsha, Vrinda Publication.
2. Performance Appraisal & Compensation Management: A Modern Approach, Goel, PHI.