MVN University

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

3RD SEM

SCHEME & SYLLABUS

B. TECH.

B. TECH. (LEET)

B. Tech. + M. Tech.

B. Tech. +MBA

MVN University, Palwal(Haryana)

Scheme of Studies & Syllabus 2013-14

Four year Regular Course: B. Tech. (ECE) with specialization in CDMA Technology, Medical Instrumentation, Remote Sensing, Agri Electronics

Three year Regular Course with Lateral Entry Scheme: B. Tech. (ECE) with specialization in CDMA Technology, Medical Instrumentation, Remote Sensing, Agri Electronics

Five year Regular integrated Course: B.Tech + M.Tech (ECE)with specialization in VLSI,Nano Technology, Microwave Engineering, Embedded System Design

Five Year Regular Dual Degree Course: B.Tech(ECE) + M.B.A

Semester:III

S. No	Course Title	Paper Code	Teaching Schedule			Total	Credit
			L	T	P		
1	Network Analysis and Synthesis	EEL 201	3	1	2	6	5
2	Electronic Devices and Circuits	ECL 201	3	1	0	4	4
3	Digital Electronics	ECL 203	3	1	2	6	5
4	Data Structure & Applications	CSL 205	3	1	2	6	5
5	Applied Mathematics -III	AHL 211	3	1	0	4	4
6	Managerial Economics	MSL 503	3	0	0	3	3
7	Professional Communication - III	AHP 201	1	0	2	3	NC
	Total		19	5	8	32	26

EEL 201	NETWORK ANALYSIS AND SYNTHESIS	L	T	P	Cr
		3	1	2	5

Objective: The objective of the course is to make students capable in planning and designing network systems. After the completion of the course, the students will be able to understand the basic principles and applications of the subject.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Basic Concepts

Distributed and lumped networks, Practical sources, source transformation, network reduction using Star-delta transformation, Loop and node analysis with linearly, Dependent and independent sources for DC and AC networks, coupled networks, dot-convention.

UNIT 2: Network Topology

Graph of network, Concept pf a tree and co-tree, incidence matrix, Tie-se & cut-se schedules, formation of equilibrium equations in Matrix form, solution of resistive networks, principles of duality.

UNIT 3: Network Theorms (Applictions to A.C. Networks)

Superposition's, Reciprocity, Theremin's, Norton's, Maximum power Transfer and Millan's theorems.

SECTION – B

UNIT 4: Transient Behavior and Intial Conditions

Behavior of circuit element under switching condition and their represention, evalution of intial and final convolution integral, Transformed RLC circuits for AC and DC excitations.

UNIT 5: Laplace Tranformation & Applications

Solution of networks, step, ramp amd impulse fuctions, waveform synthesis, intial and final values, convolution integral, tranformed networks and their solution.

UNIT 6: Two Port Network

Short ciruit admittance parameters, Open circuit impedance Parameters, transmission parameters, hybrid parameters relationship between parameters sets, Interconnection of two port networks.

Text Books:

1. M.E. Van Vallkenburs, "Network Analysis", PHI, 3rd Edition Reprint 2002
2. Roy Chowdhary, "Network and Systems", New Age International Publications.

Reference Books:

3. William H. Hayt Jr. and Jack E. Kemmerley, “Engineering Circuit Analysis”, 5th Edition, McGraw Hill International Edition.
4. Franklin F Kuo, “Network analysis and synthesis” John Wiley & Sons

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

List of Experiments:

Simulation based (to be performed on software available)

1. Introduction of circuit creation & simulation software like TINAPRO, P-Spice, Dr.-Spice/other relevant Software.
2. Transient response of RC, RL circuit on any of above software.
3. To find the resonance frequency, Band width of RLC series circuit using any of above software.
4. To plot the frequency response of low pass filter and determine half-power frequency.
5. To plot the frequency response of high pass filter and determine the half-power frequency.
6. To plot the frequency response of band-pass filter and determine the band-width.

Hardware Based

7. To calculate and verify "Z" & “Y” parameters of a two port network.
8. To determine equivalent parameter of parallel connections of two port network and study loading effect.
9. To calculate and verify "ABCD" parameters of a two port network.

To synthesize a network of a given network function and verify its response

ECL 201	ELECTRONIC DEVICES AND CIRCUITS	L	T	P	Cr
		3	1	0	4

Objective: The objective of the course is to provide fundamental knowledge of electronic components, devices and circuits. It covers basic principle of operations and usefulness of some of the electronic measuring instruments that help us in trouble shooting of electronic circuits

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Semiconductor

Intrinsic and extrinsic, p-type and n-type, energy band diagrams, majority and minority carrier, charge density in semiconductor, generation and recombination of charges, process of diffusion, diffusion and drift currents, Hall effects and its applications. p-n junction, depletion layer, potential barrier, electric field, forward and reverse biased junction, current components in p- n diode, current equation, V-I characteristics, cut in voltages of Si and Ge diode, transition and diffusion capacitance, power dissipation,.

UNIT 2: Diode Applications

P-N junction diode as rectifier, clipper and clamper, The diode as a circuit element, The Load line concept, The Piecewise linear diode modal, Clipping circuits, Clipping at two independent levels, Comparators, Sampling Gate, Rectifiers, Other full wave circuits, Capacitor filter additional diodes circuits.

UNIT 3: Some Special Devices

Photodiodes, photo detectors, solar cell, light emitting diodes, semiconductor lasers, light emitting materials. Tunnel Diode: degenerate semiconductors, IMPATT diode; The transferred electron mechanism: The GUNN diode, P-N-P-N diode, semiconductor controlled rectifier (SCR), bilateral devices: DIAC, TRIAC, IGBT

SECTION – B

UNIT 4: Bipolar Junction Transistor

Construction, basic operation, current components and equations,. CB, CE and CC-configuration, input and output characteristics, Early effect, region of operation, active, cutoff and saturation region Ebers-Moll model, , power dissipation in transistor, Photo transistor, UNI-Junction Transistor (UJT) : Principle of operation, characteristics.

UNIT 5: FET Construction

Construction, n channel and p channel, characteristics, parameters, Equivalent model and voltage gain, Enhancement and depletion MOSFET and its Characteristics, analysis of FET in various configuration.

UNIT 6: Operational Amplifier

Introduction Op-Amp, Block diagram & Pin Diagram of Op-Amp, Ideal characteristic Op-Amp (CMRR, Slew rate, Virtual ground)

Applications of Op-Amp: Inverting amplifier, Non inverting amplifier, Differential Amplifier, Summing amplifier, Integrator – Differentiator – Op-Amp Specifications.

Text Books:

1. Millman and Halkias, "Electronics Devices and Circuits" 2nd Ed., Tata McGraw-Hill, New Delhi, 2008.
2. NN Bhargave, "Basic Electronics & Linear Circuits" Tata McGraw Hill, 2007.

Reference Books:

3. Sedra A S and Smith K C, "Microelectronic Circuits" 4th Ed., New York, Oxford University Press, New York, 1997.
4. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th edition
5. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", 8th Ed, Pearson Education India, New Delhi, 2002.
6. Millman and Grabel, "Microelectronics", 2nd Ed. Tata McGraw-Hill ,1999.

ECL203	DIGITAL ELECTRONICS	L	T	P	Cr
		3	1	2	5

Objective: The objective of the course is to get the knowledge about the designing principles of different digital electronics circuits and to study their applications.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Digital system and binary numbers

Introduction of digital system, Signed binary numbers, cyclic codes, BCD codes, Excess-3 code, error detecting and correcting codes, hamming codes, floating point representation of number, Boolean algebra: Representation of values and complements, AND, OR, NOT operators, D'Morgans theorem-simplifying expression simple problems

UNIT 2: Gate-level minimization

Truth table of all logic gate's, universal gate, NAND and NOR implementation The K-map method up to five variable, don't care conditions, POS & SOP simplification, Quine Mc-Clusky method (Tabular method).

UNIT 3: Combinational Logic

Combinational circuits, analysis procedure, design procedure, binary adder-subtractor, decimal adder, Parity Generator and checker ,binary multiplier, magnitude comparator, decoders, encoders, multiplexers, De-Multiplexer

SECTION – B

UNIT 4: Sequential Logic

Sequential circuits, storage elements: latches, flip flops, analysis of clocked sequential circuits, state diagram, state reduction and assignments, design procedure for clocked sequential circuit from state diagram

Registers and counters: Shift registers; ripple counter, synchronous counter.

UNIT 5: Memory and Programmable Logic

Introduction PLD's types of PLD's, RAM & ROM, PLA, and PAL, FPGA and CPLD, sequential logic design using PLA& PAL.

Design at the register transfer level: Introduction ASMs, ASM chart, and design example with multiplexers.

UNIT 6: Asynchronous Sequential Logic

Introduction of ASL circuits, types of ASL circuits, Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, Primitive table, problems in

Asynchronous circuits ,race Free State assignment, hazards, Design of hazard-free switching circuits

Text Books:

1. M. Morris Mano and M. D. Ciletti, "Digital Design", 4th Edition, Pearson
2. R.P Jain, "Modern Digital Electronics",TMH,2nd Ed.

Reference Books:

1. I.J Nagrath, "Eletronics Analog & Digital" ,PHI 1999
2. Balabanian & Carlson, "Digital Logic Design Principles", Wiley Pub.
3. B.S.Nai, "Digital Electronics and Logic Design", PHI.
4. Hill & Peterson, "Switching Circuit & Logic Design", Wiley
5. G.K.Kharate, "Digital Electronics" ,Oxford Publication

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

Objective: To understand the digital logic and create various systems by using these logics

List of Experiments:

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean function using logic gates in both SOP and POS forms.
3. Verification of state tables of RS, JK, T and D flip-flops using NAND & NOR gates.
4. Implementation and verification of Decoder/De-multiplexer and Encoder using logic gates.
5. Implementation of 4x1 multiplexer using logic gates.
6. Design, and verify the 4-bit synchronous counter.
7. Design, and verify the 4-bit asynchronous counter.
8. Implement and verification of the truth table of Half-Adder and Full-Adder.
9. To study and implement the 4- Bit Magnitude comparator.
10. Mini Project.

CSL 205	DATA STRUCTURE & APPLICATIONS	L	T	P	Cr
		3	1	2	5

Objective: This subject discusses different data structures to represent real world problems and to study various ways to design algorithms to solve the problems.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Introduction to Data Structures

Definition of data structures and abstract data types, Static and Dynamic implementations, Elementary Data Organization, Data Structure operations, Algorithms, Time and space complexity of algorithms. Arrays: Representation of single and multidimensional arrays; sparse arrays - lower and upper triangular matrices.

UNIT 2: Searching and Sorting

Searching: Introduction, Linear search, Binary search. Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Merge Sort, Heap Sort, Selection Sort, Shell Sort, Radix Sort.

UNIT 3: Stack and Queues

Stacks: Introduction and primitive operations on stack; Application of stack: Stack frames, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Queues: Introduction, Array and linked representation of queues, primitive operation on queues, D-queues and priority queues

SECTION – B

UNIT 4: Linked List

Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list(Insertion and deletion, Traversing and Searching), Circular Linked List(Insertion and deletion, Traversing and Searching).

UNIT 5: Tree

Basic terminology, Binary Trees, Binary tree representation, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Insertion and Deletion in BST, AVL Trees, B-trees, Balanced multi way search trees.

UNIT 6: Graph

Terminology & Representation: Directed Graphs, Undirected Graphs & Multi-graphs, Sequential Representations of Graphs, Adjacency Matrices, Path Matrices representation,

Graph Traversal – Breadth Traversal, Depth first Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees. Applications of graph.

Text Books:

1. Ellis Horowitz, S. Sahni, D. Mehta "Fundamentals of Data Structures in C", Galgotia Book Source, New Delhi.
2. Y. Langsam, M. Augenstin and A. Tannenbaum, "Data Structures using C", Pearson Education Asia.

Reference Books:

3. S. Lipschutz, "Data Structures" Mc-Graw Hill International Editions

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

Objective: To understand the concepts of various data structures, searching, and sorting techniques.

List of Experiments:

Note: C/C++ can be used to implement the following programs.

1. Implementation of 1D and 2D array using static memory allocation.
2. Implementation of 1D and 2D array using dynamic memory allocation with the help of pointer.
3. Implementation of sparse matrices.
4. Implementation of linear and binary search.
5. Implementation of Bubble sort and Quick
6. Implementation of Heap sort
7. Implementation of Merge sort
8. Implementation of PUSH and POP operation into STACK
9. Implementation of Queue and priority queue
10. Implementation of creation, insertion, deletion, and searching operation in linked list.
11. Implementation of Binary Search tree and its operations
12. Implementation of Graph traversal.
13. Implementation of Minimum spanning tree in graph.

AHL 211	APPLIED MATHEMATICS - III	L	T	P	Cr
		3	1	0	4

Objective: The objective of the course is to get the knowledge of advanced mathematics which is useful for designing various complex circuit parameters and estimation. Also. it will help students in better understanding of the subjects of electronics which involve mathematics.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Fourier Series

Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series.

UNIT 2: Complex Analysis

Functions of Complex Variable, Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions. Limit and Continuity of a function, Differentiability and analyticity Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic (without proof), polar form of the Cauchy-Riemann equations. Harmonic functions, Integration of complex functions. Cauchy-Integral theorem and formula.

UNIT 3: Power Series & Contour Integration

Power series, radius and circle of convergence, Taylor's Malaren's and Laurent's series. Zeroes and Singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only).

SECTION – B

UNIT 4: Linear Programming Problems

Formulation, Solving linear programming problems using (i) Graphical method (ii) Simplex method (iii) Big –M method (iv) Dual simplex method (v) Two phase method.

UNIT 5: Transportation Problem

Formulation, Basic feasible solutions, optimum solution by u-v method, unbalanced and degenerate problems.

UNIT 6: Assignment Problem

Formulation, Solution by Hungarian method, unbalanced problem, case of maximization, travelling salesman and crew assignment problems.

Text Books:

1. N. P. Bali, "Engineering Mathematics", Laxmi Publication
2. S. D. Sharma, "Operation Research"

Reference Books:

3. B. S. Grewal, "Higher Engineering Mathematics" Khanna Publishers, Delhi
4. P. K. Gupta & Kanti Swaroop, "Operation research"
5. R. K. Jain, S. R. K. Iyenger, "Advanced Engineering Mathematics"

MSL 503	MANAGERIAL ECONOMICS	L	T	P	Cr
		3	0	0	3

Objective:
The paper seeks to equip the students with the analytical tools of Economics and apply the same to rational managerial decision-making. It further seeks to develop economic way of thinking in dealing with practical business problems and challenges.

THEORY:
Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Introduction
Definition of Economics, Nature and scope of Economics. Production Possibility Curve, Relationship between Science, Engineering, Technology and Economics.

UNIT 2: Principles
Opportunity cost principle, Concept of Utility, Law of Diminishing Marginal Utility, Equi - marginal principle.

UNIT 3: Demand and Supply Analysis
Demand, Law of demand, determinants, elasticity of demand –meaning, importance, measurement of elasticity of demand, Demand Schedule, Income Elasticity, Cross Elasticity. Supply, Law of Supply, Role of Demand and Supply in determination of Price.

SECTION – B

UNIT 4: Production and Cost Analysis
Production Function: Meaning and Factors ,Law of Return to factor and Law of Return to Scale, Cost function and their nature ,Types of Cost, short run cost curves

UNIT 5: Theory and Behavior of firm
Different market structure and their characteristics: Perfect competition, Monopolistic competition, Monopoly and Oligopoly.

UNIT 6: Indian Economy
Nature of Indian Economy, Privation : meaning , Merits and Demerits,Globalisation : meaning , Merits and Demerits.

Text Books:

1. Dwivedi,D.N., "Managerial Economics", Vikas publishing house pvt ltd ,New Delhi ,Ed 2006.
2. Jain T.R. , V.K. Ohri, "Economics For Engineers", V. K. Publication

Reference Books:

3. Hirschey , Mark, "Managerial Economics", Thomson Learning, Bangalore
4. Monroe, Kent B., "Pricing-Making Profitable Decisions", MacGraw-Hill, New York
5. Keat, Paul B., and Philip K.Y. Young, "Managerial Economics – Economic Tools for Today's Decision Makers", Pearson Education, Delhi
6. Salvatore, Dominick, "Managerial Economics in a Global Economy", Thomson Learning, Hyderabad

AHP 201	PROFESSIONAL COMMUNICATION-III	L	T	P	Cr
		1	0	2	0

Objective: As the importance of English is budding with each day as a global language for professionals. Therefore, this course has been designed by keeping in mind its importance.

UNIT-1: Phonetics

i. Recapitulation of Consonant and Vowel Sounds
ii. Concept of Phonemes and Allophones
iii. Concept of Minimal Pairs
iv. Differences in pronunciation between words with
- /f/ and /P/ sounds
- /z/ and /dʒ/ sounds
- /S/ and /ʃ/ sounds
- /v/ and /w/ sounds
- /tʃ/ and /ʃ/ sounds

v. Words commonly mispronounced

UNIT-2: Reading Practice

i. Reading newspaper articles
ii. Reading magazine articles

UNIT-3: Oral Practice

i. Self Introduction
ii. Introducing others
iii. Speeches with prior preparation
iv. Extempore Speeches
v. Free Speeches

UNIT-4: Study Skills

i. Looking up a dictionary
ii. Learning pronunciation from a dictionary
iii. Filling up of examination forms
iv. Spell check