MVN UNIVERSITY

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

SCHEME & SYLLABUS

3rd SEM

Integrated B. Tech.

MVN University, Palwal(Haryana)

Scheme of Studies & Syllabus 2013-14

6 year regular degree course: Integrated B Tech(ECE) with exit option after 3 years with a Diploma in Engineering

Semester:III

S. No	Course Title	Paper Code	Teaching Schedule			Total	Credit
			L	T	P		
1	Mathematics -III	AHL 033	4	1	0	5	5
2	Electronic Devices and Circuits	ECL031	3	1	2	6	5
3	Digital Electronics	ECL033	3	1	2	6	5
4	Network Filters and Transmission Lines	EEL035	3	1	2	6	5
5	Data Structure Using C	CSL031	3	1	2	6	5
6	Language Communication - III	AHP 031	1	0	2	3	NC
	Total		17	5	10	32	25

AHL 033	MATHEMATICS - III	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: Multiple Integrals & Beta and Gamma functions:

Beta and gamma functions and relationship between them. Dirichlet's integral , Double integral, change of order of integration, double integral in polar coordinates, triple integral , change of variables.

UNIT 2: Vector Calculus:

Differentiation of vectors, Scalar and Vector point functions, Gradient, Divergence, Curl, Directional derivatives, Properties. Integration of vector functions, Line integrals.

UNIT 3: Numerical Methods:

Interpolation and Curve Fitting: Introduction to interpolation, Lagrange approximation, Newton polynomials, least squares lines, curve fitting.

SECTION – B

UNIT 4: Solution of Algebraic Equations:

Bisection method, Regula-falsi method, Newton-Raphson method and secant methods.

UNIT 5: Solution of Linear Systems:

Gauss elimination method, UV factorization, Iterative method- Gauss seidal and Jacobi's method.

UNIT 6: Statistics:

Concepts of discrete and continuous data -Presentation of data , Cumulative frequency Mean, Median, Mode, Standard Deviation, Variance, and Coefficient of Variation for raw and classified data.

Text Book:

1. B.S. Grewal, "Higher Engineering Mathematics" Khanna Publishers, Delhi

Reference Book:

2. B.S. Grewal, "Numerical Methods" Khanna Publishers, Delhi
3. R. K. Jain, S. R. K. Iyenger, "Advanced Engineering Mathematics"

ECL 031	ELECTRONIC DEVICES AND CIRCUITS	L	T	P	Cr
		3	1	2	5

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 components that help us in designing 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

UNIT1: Semi conductor physics

Basic atomic structure and energy levels, concept of insulators, conductors and semi conductors, atomic structure of Ge and Si, covalent bonds. Energy level diagram of conductors, insulators and semi conductors; minority and majority carriers.

UNIT 2: Intrinsic and Extrinsic Semi Conductor

Concept of intrinsic and extrinsic semi conductor, P and N impurities, doping of impurity. P and N type semiconductors and their conductivity. Effect of temperature on conductivity of intrinsic semi conductor.

UNIT 3: Semi conductor diode

PN junction diode, mechanism of current flow in PN junction, Drift and diffusion current, depletion layer, forward and reverse biased PN junction, potential barrier, concept of junction capacitance in froward and reverse bias condition. V-I characteristics and applications of diode.

SECTION – B

UNIT4: Rectifier and Filter

Diode as half wave, full wave and bridge rectifier. PIV, rectification, efficiencies and ripple factor calculations, Types of diodes, characteristics and applications of Zenor diodes. Zenor and avalanche breakdown.

UNIT5: Diode Family

Photodiodes, photo detectors, solar cell, light emitting diodes, semiconductor lasers, light emitting materials. Tunnel Diode: degenerate semiconductors, DIAC, TRIAC.

UNIT6: Introduction to Bipolar transistor

Concept of bipolar transistor, structure, PNP and NPN transistor, their symbols and mechanism of current flow; Current relations in transistor; concept of leakage current; types of configuration

CB, CE, CC configuration of the transistor.

Text Books:

1. N.N. Bhargava, "Basic Electronics and Linear Circuits", Tata McGraw Hills, New Delhi
2. V.K. Mehta, "Principles of Electronics", S. Chand & Company Ltd, 2000.

Reference Books:

1. Millman and Halkias, "Electronic Devices and Circuits", McGraw Hills, New Delhi.
2. Donald Schilling & Charles Belove, "Electronics Circuits Discrete and Integrated", Third edition, McGraw Hill International edition, 1989.
3. Sedra and Smith, "Microelectronic Circuits", Oxford University press, 5th Edition, 2005.
4. J. Michael Jacob, "Applications and design with Analog Integrated Circuits", PHI, 2nd Edition, 2004.

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:

1. Plot the forward and reverse V-I characteristics of P-N junction diode .
2. To plot the characteristic of Zener diode.
3. Realize Half Wave Rectifier.
4. Realize Full Wave Rectifier.
5. Realize Full Wave Bridge Rectifier
6. Study of I/P and O/P characteristics of BJT in CE configuration.
7. Study of I/P and O/P characteristics of BJT in CB configuration.
8. Study of I/P and O/P characteristics of BJT in CC configuration.
9. Plot the characteristics curve for DIAC.
10. Plot the characteristics curve for TRIAC.

ECL033	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: Number System and Codes

Introduction of digital system, number systems Decimal, Binary, Octal, Hexadecimal, Conversion from one number system to other, and also it's r's and (r-1)'s complements, Signed binary numbers, cyclic codes, BCD codes, Excess-3 code, error detecting and correcting codes, hamming codes, floating point representation of number

UNIT 2: Gate-level minimization

Basic laws and Demorgan's Theorems,Logic gates OR, AND, NOT, NOR, NAND, EX-OR Symbols, Truth table and Boolean expression, Realization of gates using universal gates NAND, and NOR. Simplification of Boolean expression using karnaugh map (upto 4 variable)

UNIT 3: Combinational Logic

Introduction of Combinational circuits, Binary adder (Half & Full adder), Binary Subtractor (Half & Full subtractor), Parity Generator and checker, magnitude comparator(1 bit,2-bit,4 bit), Binary Multiplier, Decoder(3 to 8 decoder , BCD to seven segment Decoder),Encoder's. Multiplexer, De-multiplexer

SECTION – B

UNIT 4:Sequential logic

Sequential circuits, Flip-flops: RS, D, T,JK ,Master Slave Flip Flops ,Edge triggered FF ,Binary Counter, Decade counter ,Mod n counter ,Up Down Counter, Ring counter, Johnson counter, Shift register :4 bit shift register ,Serial in Serial out ,Serial in Parallel out ,Parallel in serial out, Bi-directional shift register

UNIT 5: D/A, A/D and Memory

D/A Converter: Basic Concepts, Weighted Resistor D/A converter, R-2R Ladder D/A converter **A/D converter:** Ramp method, Successive approximation method, Dual slope method, simultaneous method voltage to frequency converter, Frequency to voltage converter.

Memory: Static Memory ,Dynamic Memory, Static Memory organization in terms of address lines, control lines and data lines ,Expanding memory (say 8k to 16k) – SDRAM – DDR RAM.

UNIT 6: Digital Logic families

TTL, CMOS, LS series, Fan in, Fan out, Propagation delay, Noise immunity for the above families

Text Books:

5. M. Morris Mano and M. D. Ciletti, "Digital Design", 4th Edition, Pearson
6. 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.

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 SOP forms.
3. Implementation of the given Boolean function using logic gates in POS forms.
4. Verification of state tables of RS, JK flip-flops using NAND & NOR gates.
5. Verification of state tables of T & D flip-flops using NAND & NOR gates.
6. Implementation and verification of Decoder/De-multiplexer
7. Implementation and verification of Encoder using logic gates.
8. Implementation of 4x1 multiplexer using logic gates.
9. Implement and verification of the truth table of Half Adder.
10. Implement and verification of the truth table of Full Adder.

EEL 035	NETWORK FILTERS AND TRANSMISSION LINES	L	T	P	Cr
		3	1	2	5

Objective: The objective of the course is to provide fundamental knowledge of networks, filters and transmission lines. It covers various transmission parameters and filter study. It is also helpful in maintaining the transmission lines.

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: Networks

Two port (four terminals) network, Symmetrical and asymmetrical networks: Balanced and unbalanced network; T-network, π network, Ladder network; Lattice network; L-network and Bridge T-network ,Symmetrical Network:, Asymmetrical Network, image impedance, The half section (L-section); symmetrical T and π sections into half sections.

UNIT 2: Network Theorems

A brief study of following:

- Tellegen's Theorem
- Superposition theorem
- Substitution theorem
- Thevenin and norton theorem
- Reciprocity – maximum power transfer theorem
- Attenuators: brief idea about attenuators and its types

UNIT 3 Filters

Brief idea of the use of filter networks in different communication systems, concept of low pass, high pass, band pass and band stop filters. Prototype Filter Section, Impedance characteristics Vs frequency characteristics of a low and high pass filter.

SECTION – B

UNIT 4: Transmission Lines

Transmission Lines, their types and applications. Distributed constants, T and π representation of transmission line section. Definition of characteristic impedance, propagation constant, attenuation constant and phase shift constant. Concept of infinite line, Condition for minimum distortion and minimum attenuation of signal on-the-line and introduction to loading methods. Concept of reflection and standing waves.

UNIT 5: Transmission Lines Parameters

Definition of reflection coefficient, SWR & VSWR and their relation (no derivation) Transmission line equation, expression for voltage, current and impedance at a point on the line, Concept of transmission lines at high frequencies, Introduction to stubs. (Single, open and short stubs).

UNIT 6: Attenuation vs. Frequency

Units of attenuation (Decibels and Napers): General characteristics of Attenuators Analysis and design of simple attenuator of following types; Symmetrical T and π type, L type. Phase shift Vs frequency, characteristics impedance Vs frequency of T and π filters and their significance, Active Filters, Basic concept of active filters and their comparison with passive filters.

Text Books:

3. AK Chakarvorty, "Network Filters and Transmission Lines", Dhanpat Rai & Co. Publication, New Delhi.
4. Soni and Gupta, "Network Analysis", Dhanpat Rai & Co. Publication, New Delhi.

Reference Books:

7. John D Ryder, "Network Lines and Fields", Prentice Hall of India, New Delhi.
8. Van Valkenbury, "Network Analysis", Prentice Hall of India, New Delhi.

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:

11. Measurement of characteristics impedance of a symmetrical Pi networks.
12. Measurement of characteristics impedance of a symmetrical T networks.
13. Image impedance of a given asymmetrical Pi networks.
14. Image impedance of a given asymmetrical T networks.
15. Determine experimentally the characteristics impedance of a prototype Low pass filters
16. Determine experimentally the characteristics impedance of a prototype High pass filters
17. To design and measure the attenuation of a symmetrical Pi type attenuation
18. To design and measure the attenuation of a symmetrical T type attenuation
19. To plot the impedance characteristics of m-derived low pass filter
20. To plot the attenuation characteristics of a m-derived high pass filter
21. Measurement of characteristics impedance propagation constant, VSWR for a given T.L. (transmission line)

CSL 031	DATA STRUCTURES USING C	L	T	P	Cr
		3	1	2	5

Objective: This subject focuses on the Algorithms used in Computers. It provides knowledge about basic algorithms and their complexities and elaborates various searching and sorting techniques used in computer science.

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

Algorithms and their complexities calculation. Data Structures: Concept, Overview, operations, and Implementation.

Arrays: Definition, Terminology, One dimensional array, Memory Allocation, Operations, and Applications. Multidimensional Arrays - Two dimensional arrays, three dimensional, and n - Dimensional arrays, sparse matrices. Linear and binary search, Recursion.

UNIT 2: Linked Links

Linked Lists: Definition, Single Linked List, operations on single linked list, Circular Linked List and operations, Double Linked List and operations. Static and dynamic memory allocations.

UNIT 3: Stack and Queues

Stacks: Definition, Representation of Stack, Operations on Stacks, Applications of Stack, Evaluation of Arithmetic Expressions.

Queues: Definition, Representation of Queues, operations on queues, priority Queue Structures, Application of Queues - CPU scheduling - Round Robin algorithm.

SECTION – B

UNIT 4: Trees

Trees: Basic Terminologies, Definition and Concepts, Representation of Binary Tree, Operations on Binary Tree. Binary search tree (BST) and operations on BST, Tree traversal, Threading, Heap and operations on heap, Introduction of AVL and B-trees.

UNIT 5: Graphs

Graphs: Introduction, Graph Terminologies, Representation of Graphs, Operations on Graphs, Graph traversal, Minimum spanning tree, Finding shortest path in graph.

UNIT 6: Sorting techniques

Bubble sort, Quick sort, Merge sort, Insertion sort, selection sort, radix sort, heap sort, comparison of various sorting techniques.

Text Books:

5. Seymour Lipschutz, "Schaum's outlines Data Structures with C", Tata McGraw Hill

Reference Books:

9. Samanta. D, "Classic data structures", Prentice-Hall of India, 2007
10. Langsem, Augenstein, Tenenbaum, "Data structures using C and C++", Prentice Hall of India/Pearson education.
11. ISRD Group, "Data structures using C", Tata McGrawHill, 2006

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 the factorial calculation using recursion
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.

AHP 031	LANGUAGE 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

- Revision of Speech Sounds
- Phonetic Transcription of Words-III
- Syllable Identification in polysyllabic words
- Words Commonly Mispronounced- III
- Word Stress-I

UNIT-2: Reading Practice

- Reading newspaper articles
- Reading magazine articles
- Reading short stories

UNIT-3: Oral Practice

- Extempore Speeches
- Role Plays and Simulations
- Debate
- Group Discussions
- Classroom Presentations

UNIT-4: Study Skills

- Commonly Misspell Words-III
- Dictation
- Looking up a dictionary
- Learning pronunciation from a dictionary (Practical implementation of IPA symbols)
- Learning meanings of words from the dictionary
- Crosswords