MVN UNIVERSITY

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

SCHEME & SYLLABUS

6^{TH} SEM

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

Semester:VI

S. No	Course Title	Paper Code	Teaching Schedule			Total	Credit
			L	T	P		
1	Digital System Design	ECL312	3	1	2	6	5
2	Computer Networks	CSL308	3	1	0	4	4
3	TV Engineering	ECL314	3	1	0	4	4
4	Digital Signal Processing	ECL316	3	1	2	6	5
5	Control System Engineering	EEL306	3	1	2	6	5
6	Microwave and Radar Engineering	ECL318	3	1	2	6	5
7	VAC -II	ECV 302	0	0	2	2	NC
	Total		18	6	10	34	28

MVN University, Palwal(Haryana)

Scheme of Studies & Syllabus 2013-14

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

Semester:VI

S. No	Course Title	Paper Code	Teaching Schedule			Total	Credit
			L	T	P		
1	Advanced Digital System Design	ECL322	3	1	2	6	5
2	Control System Engineering	EEL306	3	1	2	6	5
3	Microwave and Radar Engineering	ECL318	3	1	2	6	5
4	TV Engineering	ECL314	3	1	0	4	4
5	VLSI Technology	ECL 422	3	1	0	4	4
6	Telecommunication Switching System	ECL 506	4	0	0	4	4
7	VAC - II	ECV 302	0	0	2	2	NC
	Total		19	5	10	34	28

MVN University, Palwal(Haryana)

Scheme of Studies & Syllabus 2013-14

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

Semester:VI

S. No	Course Title	Paper Code	Teaching Schedule			Total	Credit
			L	T	P		
1	Digital System Design	ECL312	3	1	2	6	5
2	Control System Engineering	EEL306	3	1	2	6	5
3	Microwave and Radar Engineering	ECL318	3	1	2	6	5
4	Marketing Managemant	MSL 504	3	0	0	3	3
5	Human Resource Management	MSL 506	3	0	0	3	3
6	Digital Signal Processing	ECL316	3	1	2	6	5
7	VAC- II	ECV 302	0	0	2	2	NC
	Total		18	4	10	32	26

ECL 312	DIGITAL SYSTEM DESIGN	L	T	P	Cr
		3	1	2	5

OBJECTIVE: To understand the basic principles of Digital system design using XILIX ISE - 10.1

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

Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL data objects, classes and data types, Operators, Overloading, logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioral dataflow and structural models.

UNIT 2: VHDL Statements

Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.subprograms Application of Functions and Procedures, Structural Modeling, component declaration, structural layout and generics.

UNIT 3: Combinational & Sequential Circuit Design

VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders , code converters, comparators, implementation of Boolean functions etc. VHDL Models and Simulation of Sequential Circuits Shift Registers, Counters etc.

SECTION -B

UNIT 4: Design of Microcomputer & Programmable Device

Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL Programmable logic devices : ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

UNIT 5: Design of Programmable Device

ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

UNIT 6: Sequential Circuit Design

Design of Iterative circuits, design of sequential circuits using ROMs and PLAs, sequential circuit design using CPLD, FPGAs.

TEXT BOOK

1. "A VHDL Primmer" : Bhasker; Prentice Hall 1995.
2. VHDL-IV Edition :Perry; TMH (2002)

REFERENCE BOOK

1."Introduction to Digital Systems" : Ercegov ac. Lang & Moreno; John Wiley (1999).
2..Fundamentals of Digital Logic with VHDL Design : Brown and Vranesic; TMH (2000)
3..Modern Digital Electronics- III Edition: R.P Jain; TMH (2003).
4..Grout - Digital system Design using FPGA & CPLD 'S,Elsevier

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. Design all gates using VHDL.

2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
    a. Half adder
    b.full adder
3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
    a. Multiplexer
    b.demultiplexer
4.Write VHDL programs for the following circuits, check the wave forms and the hardware generated Decoder

5.Write a VHDL program for a comparator and check the wave forms and the hardware generated

6.Write a VHDL program for a code converter and check the wave forms and the hardware generated

7.Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated

8.Write a VHDL program for a counter and check the wave forms and the hardware generated

9.Write VHDL programs for the following circuits, check the wave forms and the hardware generated
    a. register
    b. shift register
10.Write VHDL programs for the following circuits, check the wave forms and the hardware gnerated Encoder.

CSL308	COMPUTER NETWORKS	L T P	Cr
		3 1 0	4

Objective:

This course fully covers computer networks fundamentals and different types of networks.

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:
Data communications: components, data representation (ASCII,ISO etc.), direction of data flow (simplex, half duplex, full duplex),network criteria, Introduction to Computer Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular – Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks;

Unit-2 OSI & TCP Reference Model:
Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer, History of TCP/IP, Layers of TCP/IP, Protocols,

Unit-3 TCP:
Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

Section-B

Unit-4 Local Area Networks:
Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.
Metropolitan Area Network: Distributed queue dual bus(DQDB).

Unit-5 Wide Area Networks:
Introduction of WANs, Routing, Congestion Control, WAN Technologies, Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.

Unit-6: Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

Text Book:

1. Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

Reference Books:

1. Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
2. Business Data Communications, Fitzgerald Jerry,.
3. Larry L. Peterson & Bruce S. Davie, 2ND Edition Computer Networks – A System Approach, Computer Networking – ED Tittel , 2002, T.M.H.

ECL 314	TELEVISION ENGINEERING	L T P	Cr
		3 1 0	4

Objective: The objective of the course is to provide knowledge of Television Engineering. It covers basic principle of operations and usefulness of Television engineering.

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: Elements Of A Television System

Picture transmission, sound transmission, picture reception, sound reception synchronization, receiver controls, color television. Analysis and Synthesis of Television Pictures: Gross structure, image continuity, no. of scanning lines, flicker, fine structure, tonal gradation.

UNIT 2: Composite Video Signal

Video signal dimensions, horizontal sync details, vertical sync details, scanning sequence details, functions of vertical pulse train, sync de- tails of 525 line system.

UNIT 3: . Signal Transmission and Channel Bandwidth

Amplitude Modulation, channel bandwidth, vestigial side band trans-
mission, Transmission efficiency, complete channel bandwidth, recep- tion of vestigial side band signals, frequency modulation, FM channel bandwidth, channel bandwidth for color transmission, allocation of
frequency bands for television signal transmission, television standards.

SECTION – B

UNIT 4 The Picture Tube

Monochrome picture tube, Beam deflection, screen phosphor, face plate,
picture tube characteristics, picture tube circuit controls.Television Camera Tubes: Basic principal, Image orthicon, Vidicon.

UNIT 5: Basic Television Broadcasting

Television transmitter, positive & negative modulation. Television Receiver: Receiver sections, vestigial side band correction, choice of intermediate frequencies, picture tube circuitry & controls, sound signal separation, sound section, Sync processing & AFC cir- cuit, vertical Deflection circuit, Horizontal deflection circuit. Television Signal propagation & Antennas: Television Transmission antennas , television receiver antennas, color television antennas.

UNIT 6: Essentials Of Color Television And Televesion Applications

Compatibility, natural light, color perception, three color television Camera the luminance signal, values of Luminance & color difference signals on Colors, color television display tubes (Delta gun, PIL, Trinitron).

Color signal transmission, bandwidth for color signal transmission.

Text Books:

1.Monochrome and Color Television : R.R.Gulati ; New Age.

Reference Books:

1. TV and Video Engineering : Dhake ; TMH.

ECL 316	DIGITAL SIGNAL PROCESSING	L T P	Cr
		3 1 2	5

Objective: The objective of the course is to introduce the fundamentals of Digital Signal Processing, Providing an in-depth understanding of discrete time signals and systems, sampling and z-transform.

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: Discrete-Time Signals:

Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, energy and power theorems.

UNIT 2: Discrete-Time Systems :

Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

UNIT 3: Sampling Of Time Signals:

Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

SECTION – B

UNIT 4: Z-Transform :

Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

UNIT 5: Basics Of Digital Filters :

Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters : window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.

UNIT 6: Multirate Digital Signal Processing:

Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

Text Books:

1. Digital Signal Processing : Proakis and Manolakis; PHI
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

Reference Books:

1. Digital Signal Processing: Alon V. Oppenhelm;PHI
2. Digital Signal processing(II-Edition): Mitra, TMH

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.To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).

2.To develop program for discrete convolution.

3.To develop program for discrete correlation.

4.To understand stability test.

5.To understand sampling theorem.

6.To design analog filter(low-pass,

high pass, band-pass, band-stop).

7.To design digital IIR filters(low-pass, high pass, band-pass, band-stop).

8.To design FIR filters using windows technique.

9.To design a program to compare direct

realization values of IIR digital filter

10.To develop a program for computing parallel realization values of IIR digital filter.

11.To develop a program for computing cascade realization values of IIR digital filter

12. To develop a program for computing inverse Z-transform of a rational transfer function.

EEL 306	CONTROL SYSTEM ENGINEERING	L T P	Cr
		3 1 2	5

Objective: To provide sound knowledge in the basic concepts of linear control theory and design of control system.

- To understand the open loop and closed loop (feed back) systems.
- To develop the mathematical model for mechanical and electrical systems.
- To understand time domain and frequency domain analysis of control systems required for stability analysis
- To understand the compensation technique that can be used to stabilize control systems

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: Introductory Concepts:

System/Plant model, types of models, illustrative examples of plants and their inputs and outputs, linear time-invariant (LTI) system, time-varying system, causal system, open & closed loop control system, illustrative examples of open-loop and feedback control systems, continuous time and sampled data control systems. Effects of feedback on sensitivity, stability, external disturbance (noise), overall gain etc. Introductory remarks about non-linear control systems.

UNIT 2: Mathematical Modeling:

Concept of transfer function, relationship between transfer function and impulse response, order of a system, block diagram algebra, signal flow graphs: Mason's gain formula & its application, characteristic equation, derivation of transfer functions of electrical and electromechanical systems.

UNIT 3: Time Domain Analysis:

Typical test signals, time response of first order systems to various standard inputs, time response of 2nd order system to step input, relationship between locations of roots of characteristic equation,

Time domain specifications of a general and an under-damped 2nd order system, steady state error and Error constants. Concept of stability, pole zero configuration and stability, necessary and sufficient conditions for stability Hurwitz stability criterion Routh stability criterion and relative stability.

SECTION – B

UNIT 4: Root Locus & State-space analysis: .

Root locus concept, development of root loci for various systems, stability considerations. Introduction of state-space analysis & design.

UNIT 5: Frequency Domain Analysis:

Relationship between frequency response and time-response for 2nd order system, polar, Nyquist, Bode plots, stability, Gain margin and Phase Margin, relative stability, frequency response specifications..

UNIT 6: Compensation Networks & Controllers:

Necessity of compensation, Compensation networks (lead &lag) & their application, basic modes of feedback control, proportional, integral and derivative controllers, illustrative examples. Servomotors, stepper motors, magnetic Amplifier & their applications.

Text Books:

1. Nagrath I J and Gopal .M., "Control Systems Engineering", Anshan Pub, 2008..
2. Control Systems - Principles & Design : Madan Gopal; Tata Mc Graw Hill
3. Automatic Control System : S.Hasan Saheed

Reference Books:

1. Automatic Control Systems : B.C.Kuo, PHI
2. Modern Control Engg : K.Ogata; PHI
3. Control system engg. : B.S.Manke

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. To study & plot speed -Torque characteristic of A.C. servo motor.
2. To study & plot the speed-Torque characteristic of DC servo motor.
3. To demonstrate simple motor driven closed loop DC position control system.
4. To study the lead, lag, lead-lag compensators and to draw their magnitude and phase plots.
5. To study the synchro transmitter & receiver.

MATLAB Based (Any Five Expt.)

1. Introduction to MATLAB (Control System Toolbox).
2. Plot the pole-zero configuration in s-plane for the given transfer function.
3. Plot unit step response of given transfer function and find peak overshoot, peak time, t_r, t_p.

4. Plot root locus of given transfer function.
5. Plot bode plot of given transfer function and find gain and phase margins.
6. Plot the Nyquist plot for given transfer function and to discuss closed loop stability, gain and phase margin.
7. Plot Polar plot of given transfer function and find gain and phase margins.

ECL 318	MICROWAVE & RADAR ENGINEERING	L T P	Cr
		3 1 2	5

Objective: The objective of the course is to introduce the fundamentals of Waveguides and transmission lines, Providing an in-depth understanding of Microwave components, Tubes and Microwave Measurements.

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: Waveguides And Transmission Line:

Introduction, comparison with transmission lines, propagation in TE & TM mode, rectangular wave guide, TEM mode in rectangular wave guide, characteristic impedance, introduction to circular waveguides and planar transmission lines.

UNIT 2: Microwave Components:

Directional couplers, tees, hybrid ring, Sparameters, attenuators, cavity resonators ,mixers & detectors, matched Load, phase shifter ,wave meter, Ferrite devices: Isolators, circulators.

UNIT 3: Microwave Tubes:

Limitation of conventional tubes; Construction, operation and properties of Klystron amplifier, reflex Klystron, magnetron, TWT , BWO , crossed field amplifiers.

SECTION – B

UNIT 4: Microwave Solid State Devices & Measurements:

Varactor diode, Tunnel diode, Schottky diode, GUNN diode, IMPATT, TRAPATT and PIN diodes. MASER, parametric amplifiers .

UNIT 5: Microwave Measurements:

Power measurement using calorimeter & bolometers measurement of SWR, frequency, wavelength and impedance. Microwave bridges.

UNIT6: Radar:

Block Diagram and operation, Radar Frequencies, Simple form of Radar Equation, Prediction of Range Performance, Pulse Repetition frequency and Range Ambiguities, Applications of Radar

Text Books:

1.Microwave devices and circuits :Samuel Liao;PHI
2.Microwave devices & Radar Engg :M .Kulkarni;Umesh

Reference Books:

1. Microwaves and Radar : A.K. Maini; Khanna

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. Study of wave guide components.
2. To measure frequency of microwave source and demonstrate relationship among guide dimensions, free space wave length and guide wavelength.
3. To measure VSWR of unknown load and determine its impedance using a smith chart.
4. Study of characteristics of Gunn oscillator & Gunn diode as modulated source (PIN modulation) and determination of modulation depth.
5. Study of insulation & coupling coefficient of a magic T & coupling coefficient and directivity of a directional coupler
6. Measurement of attenuation of a attenuator and isolation, insertion loss, cross coupling of an circulator.
7. Study of waveguide horn and its radiation pattern and determination of the beam width.
8. To study working of MIC Components like Power Divider , Ring resonator, Filters & Microwave Amplifier
9. To study Measurement of Guide wavelength (λg).,Free Space wavelength (λ). & Concept of reduction of wavelength due to substrate material
10. Measurement of SWR in a Microwave transmission line.
11. To study working of Doppler radar & measure RPM, object Counter & velocity.
12. Study of audio & data communication over Microwave bench.
13. Measurement of microwave power using power meter.

ECV 302	VAC -II	L T P	Cr
		0 0 2	NC

Objective:

1. To Make students capable to fulfill expectations' of Industry.
2. To increase the employability by conducting technical training programs.
3. Organizing Guest Lecturers, Industrial Visit, internship, students training.
4. Organizing workshops, conferences and symposia with joint participation of the faculty and the Industries

SECTION – A

UNIT 1: Specific skills:

Deep Knowledge of basic electronics equipment & Components, Basics of Information & Communication Technology, Basics of wireless & Mobile Communication, Basics of Antenna Design

UNIT 2: Basics of Networking:

Basics of Embedded systems. Training on special softwares like MATLAB, VHDL, Proteus, Kiel, Antenna Design related softwares for proper understanding of basic concepts.

UNIT 3: Business Etiquettes:

Listening skill, Verbal communication, written communication, Business ethics, Professionalism. Creative skills, interpersonal skills, leadership skills.

SECTION – B

UNIT 4: Verbal Ability:

English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.

UNIT 5: Verbal Reasoning:

Number Series, Alphabet Series, Test of Direction Sense, Coding-Decoding, Number Ranking, Arithmetical Reasoning, Problem on Age Calculation, Blood Relations, Decision Making etc.

UNIT 6: Non-verbal Reasoning:

Non Verbal Series, Mirror Images, Grouping Identical Figures

Text & Reference Books:

As per current scenario and suggested by the concerned teacher

ECL 322	ADVANCED DIGITAL SYSTEM DESIGN	L	T	P	Cr
		3	1	2	5

Objective: To understand the digital system design using PLA its programming and test pattern generation.

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: Design Of Digital Systems

ASM charts, Hardware description language and control sequence method, Reduction of state tables, state assignments.

UNIT 2: Sequential Circuit Design

Design of Iterative circuits, design of sequential circuits using ROMs and PLAs, sequential circuit design using CPLD, FPGAs.

UNIT 3: Fault Modeling And Test Generation

Fault classes and models – Stuck at faults, bridging faults, transition and intermittent faults. Fault diagnosis of Combinational circuits by conventional methods – Path Sensitization technique, Boolean difference method, Kohavi algorithm.

SECTION – B

UNIT 4: Test Pattern Generation

D - Algorithm, PODEM, Random testing, transition count testing, Signature Analysis and testing for bridging faults.

UNIT 5: Fault Diagnosis in Sequential Circuits

State identification and fault detection experiment. Machine identification, Design of fault detection experiment.

UNIT 6: Programming Logic Arrays and PLA Testing

Design using PLA's, PLA minimization and PLA folding. Fault models, Test generation and Testable PLA design

TEXT BOOKS:

1. "A VHDL Primmer" : Bhasker; Prentice Hall 1995.

2. Nolman Balabanian, Bradley Calson – "Digital Logic Design Principles" – Wily Student Edition 2004.

REFRENCE BOOKS:

1. M. Abramovici, M. A. Breues, A. D. Friedman – "Digital System Testing and Testable Design", Jaico Publications

2. Charles H. Roth Jr. – “Fundamentals of Logic Design”.

3. Frederick. J. Hill & Peterson – “Computer Aided Logic Design” – Wiley 4th Edition.

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. Design all gates using VHDL.

2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated

    a. Half adder

    b.full adder

3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated

    a. Multiplexer

    b.demultiplexer

4.Write VHDL programs for the following circuits, check the wave forms and the hardware generated

    a.decoder

    b.encoder

5.Write a VHDL program for a comparator and check the wave forms and the hardware generated

6.Write a VHDL program for a code converter and check the wave forms and the hardware generated

7.Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated

8.Write a VHDL program for a counter and check the wave forms and the hardware generated

9.Write VHDL programs for the following circuits, check the wave forms and the hardware generated

    a. register

    b. shift register

ECL 422	VLSI TECHNOLOGY	L	T	P	Cr
		3	1	0	4

Objective: The course is designed to give the student an understanding of different design steps required to carry out a complete digital VLSI (Very-Large-Scale Integration) design in silicon.

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: CRYSTAL GRTOWTH AND EPITAXY:

Advantages of IC's, General classification of IC's(Linear/Digital IC's , Monolithic/ Hybrid IC's), Starting material for formation of crystal, Czochralski growth, Distribution of dopants, Zone refining, Silicon Float Zone process, Si-Wafer preparation, Epitaxial growth, Techniques used for epitaxial growth(LPE,VPE,MBE).

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UNIT 2: SILICON OXIDATION:

Oxidation - Thermal (Kinetics of growth , Thin oxide growth), Effect of impurities on the oxidation rate, Preoxidation Cleaning, Various oxidation techniques, Dry & Wet, High Pressure and Plasma Oxiadation,

UNIT 3: Lithography and Etching:

Optical Lithography, Photomask, Photo resist and Process, Electron Lithography, X-ray Lithography, Ion Beam Lithography, Photolithography Process(Lift off technology , Fine line photolithography) Masking properties of Sio_2 Pattern generation/Mask making, Contact and Proximity printing, Photoresistsl, Wet/Dry etching, Reactive Plasma etching techniques and applications.

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SECTION – B

UNIT 4: Diffusion and Ion Implantation:

Basic diffusion process(Diffusion equation, Diffusion profiles), Extrinsic diffusion, Lateral Diffusion, Ion Implantation Process (Ion distribution , Ion Stopping), Implant Damage and Annealing process (Furnace and RTA), VI IC PACKAGING, Isolation Techniques, Testing of the Chip, Wire Bonding techniques, Flip Chip technique, Various Packaging methods and Materials,.

UNIT 5: Fabrication:

VII FABRICATION OF MONOLITHIC COMPONENTS, Fabrication of Diodes, Resistors, capacitors and inductors, Fabrication of BJT and FET, Fabrication of MOS Devices , CMOS fabrication techniques(n-well and p-well process sequences).

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UNIT 6: Fabrication Facilities and Environment:

pure water system, clean room and personnel, Characteristics of VLSI, Problem of raising the scale of integration - Causes of IC failures - Electron static Discharge Damage and Alpha Particle Induced soft errors, Yield and Reliability, Methods of reliability evaluation, Non silicon Technology (GaAs ICs), Future trends.

Text Books:

1. Fundamental of Semiconductor Fabrication:Gray S.May and Simon M.Sze
2. S. M. Sze, "VLSI Technology" Mc. Graw Hill.

Reference Books:

1. Microelectronics: Jacob and Millman

ECL 506	TELECOMMUNICATION SWITCHING SYSTEMS	L	T	P	Cr
		4	0	0	4

Objective: To learn Switching, Signaling and traffic in the context of telecommunication network. Expose through the evolution of switching systems from manual and electromechanical systems to stored-program-controlled digital systems.

THEORY:

Note: Five questions are to be attempted out of six questions covering three questions from each section A & B.

SECTION – A

UNIT 1: Switching

Switching Functions, Space Division Switching, Time Division Switching, two-dimensional Switching: STS Switching, TST Switching, No.4 ESS Toll Switch, Digital Cross-Connect Systems, Digital Switching in an Analog Environment. Elements of SSN07 signaling.

UNIT 2: Network Control

Timing: Timing Recovery: Phase-Locked Loop, Clock Instability, Jitter Measurements, Systematic Jitter. Timing Inaccuracies: Slips.

UNIT 3: Synchronization & Management

Asynchronous Multiplexing, Network Synchronization, U.S. Network Synchronization, Network Control & Management

SECTION – B

UNIT 4 : Digital Subscriber Access ISDN

ISDN Basic Rate Access Architecture, ISDN U Interface, ISDN D Channel Protocol. High-Data-Rate Digital Subscriber Loops: Asymmetric Digital Subscriber Line, VDSL.

UNIT 5 : Digital Loop Carrier Systems

Universal Digital Loop Carrier Systems, Integrated Digital Loop Carrier Systems, Next-Generation Digital Loop Carrier, Fiber in the Loop, Hybrid Fiber Coax Systems, Voice band Modems: PCM Modems, Local Microwave Distribution Service, Digital Satellite Services.

UNIT 6 : Traffic Characterization:

Arrival Distributions, Holding Time Distributions, Loss Systems, Network Blocking Probabilities: End-to-End Blocking Probabilities, Overflow Traffic, Delay Systems: Exponential service Times, Constant Service Times, Finite Queues.

Text Book:

1. Viswanathan. T., "Telecommunication Switching System and Networks", Prentice Hall of India Ltd., 1994.

Reference Books:

1. Bellamy John, "Digital Telephony", John Wily & Sons, Inc. 3rd edn. 2000.
2. V.S.Bagad, "Telecommunication Switching System & Networks" Tata McGraw Hill.
3. Gnanasivam, "Telecommunication Switching & Networks" 2nd Edition New Age Publication.
4. Flood, "Telecommunication Switching, Traffic and Networks" Pearson Education, India

MSL 504	MARKETING MANAGEMENT	L T P	Cr
		3 0 0	3

Objective: The objective of this course is to train participants to apply the basic concepts and techniques in marketing, so that they are acquainted with the duties of a marketing manager. More specifically, you will be exposed to the development, evaluation, and implementation of marketing management in a variety of business environments. Through cases and an in-depth semester-long project, students would be given opportunities to perform the role of a marketing manager.

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 Marketing: Meaning, Nature and Scope of Marketing; Marketing Philosophies; Marketing Management Process; Concept of Marketing Mix; Market Analysis: Understanding Marketing Environment.

UNIT 2: Consumer and Organization Buyer Behavior: Market Measurement; Marketing Vs Selling ,MIS and Market Research.

UNIT 3: Product Planning and Pricing: Product Concept; Types of Products; Major Product Decisions; Product Life Cycle, New Product Development Process; Pricing Decisions; Determinants of Price; Pricing Process, Policies and Strategies.

SECTION – B

UNIT 4: Tools of Product Differentiation: Product Mix ,Branding and Packaging Decisions, Marketing Segmentation ,Targeting and Positioning.

UNIT 5: Promotion and Distribution decisions: Communication Process; Promotion Tools-Advertising, Personal Selling, Publicity and Sales Promotion; Distribution Channel Decisions-Types and Functions of Intermediaries, Selection and Management of Intermediaries.

UNIT 6: Marketing Organization and Control: Emerging Trends and Issues in Marketing –

Consumerism, Rural Marketing, Social Marketing; Direct and Online Marketing; Green Marketing. Integrated Marketing Communication, Reasons and Benefits for Going International.

Text Book:

1. Meenakshi.N, Arun K,-Vikas Publication

Reference Books:

1. Kotler and Armstrong (2004). Principles of Marketing Management. PHI, 2004
2. Bull Victor P., *Marketing Management*: *A Strategic Planning Approach*, McGraw Hill, New York.
3. Czinkota M.R., *Marketing Management*, Pearson Education Asia, New Delhi 2004.

MSL 506	HUMAN RESOURCE MANAGEMENT	L T P	Cr
		3 0 0	3

Objective: The primary concern of this course is to develop an appreciation effective of effective management of human resources and to enable the students to meet HR challenges in present scenario.

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: Evolution of HRM:
HRM in India; Meaning, Nature and Scope, functions and objectives of HRM; Role, responsibilities and competencies of HR managers, Difference between HRM and Personnel Management, HRM in Dynamic environment.

UNIT 2: Human resource planning:
Objectives and process Methods and Techniques; Job Evaluation: Concept, Scope and Limitation; Job Analysis, Job enrichment, Job rotation.

UNIT 3: Selection and Recruitment:
Induction and placement; Compensation; Transfer, Promotion and Reward Policies; Training and Development; Career and Succession Planning.

SECTION – B

UNIT 4: Performance Appraisal:
Procedure, techniques, Potential Appraisal; Quality of work life; Work life balance; workers participation in management.

UNIT 5: HRIS:
Human resource audit, Human Resource accounting.

UNIT 6: Recent trends and changes:
HR in knowledge industry, HR in virtual organizations, HR in mergers and acquisitions, outplacement, outsourcing HR functions, employee leasing, international HRM.

Text Books:
1. Rao,V.S.P.,Human Resource Management ,Excel Books.
2. Gupta,C.B.,Human Resource Management , Sultan Publication.

Reference Books:
1. DeCenzo, D. A. and Robbins, S. P. (8th ed., 2005). Fundamentals of Human Resource Management. John Wiley.
2. Dessler Gary (2004). Human Resource Management. Pearson Education.
3. Ivancevich, John M. (2003). Human Resource Management. Tata McGraw Hill.