DEVI AHILYA VISHWAVIDYALAYA, INDORE

FACULTY OF ENGINEERING

SCHEME OF EXAMINATION
&
COURSE OF CONTENTS

BE III Year Program
(ELECTRONICS & TELECOMMUNICATION ENGINEERING)

INSTITUTE OF ENGINEERING & TECHNOLOGY
(www.iet.dauniv.ac.in)

DEVI AHILYA VISHWAVIDYALAYA, INDORE
INSTITUTE OF ENGINEERING & TECHNOLOGY

SCHEMES OF EXAMINATION FOR BE PROGRAMME
(Subject to Revision)

B. E. III YEAR ELECTRONICS & TELECOMMUNICATION ENGINEERING
Th- Theory, CW – Class Work, SW – Sessional Work, Pr – Practical

Semester V

						Maximum Marks				
SNo	**Sub Code**	**Subject**	**L**	**T**	**P**	**TH**	**CW**	**SW**	**Pr**	**TOTAL**
1.	3ET501	Computer Networks	4	-	2	100	50	50	50	250
2.	3ET502	Analog Communication Engineering	4	-	2	100	50	50	50	250
3.	3ET503	Analog Electronics	4	-	2	100	50	50	50	250
4.	3ET504	Microcontrollers	4	-	2	100	50	50	50	250
5.	3ET505	Linear Devices and Application	4	-	-	100	50	-	-	150
6.	3SS506	Principles of Management	2	-	-	-	50	-	-	50
	TOTAL		22	-	8	500	300	200	200	1200

Semester VI

						Maximum Marks				
SNo	**Sub Code**	**Subject**	**L**	**T**	**P**	**TH**	**CW**	**SW**	**PR**	**TOTAL**
1.	3ET551	Project – I	-	-	2	-	-	100	50	150
2.	3ET552	Telecom Networks	4	-	2	100	50	50	50	250
3.	3ET553	Object Oriented Systems	4	-	2	100	50	50	50	250
4.	3ET554	Digital Signal Processing	4	-	-	100	50	-	-	150
5.	3ET555	Control Systems	4	-	2	100	50	50	50	250
6.	3ET556	Design Workshop	-	-	2	-	-	50	50	100
7.	3SS557	Entrepreneurship Development & IPR	2	-	-	-	50	-	-	50
	TOTAL		18		10	400	250	300	250	1200

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic & Telecommunication) V Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET501 **Computer Networks**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**25**	**25**	**110**

Objectives: The content covers the different types of computer networks, the layered approach of protocol stack, its advantage, and protocols of each layer.

Pre-requisites: Fundamental knowledge of data transmission.

COURSE OF CONTENTS

Unit I

Computer network – Hardware, Software ,Reference model , physical layer

Network and application, categories of network-LAN, MAN, WAN, Wireless Network, Internetwork, Reference models.– OSI,TCP/IP model and their comparison, Line configuration-point to point, multicast ,broadcast ,Network Topology – Mesh , Star ,Tree , Bus , Ring , Hybrid

Physical Layer – Shannons maximum data rate of a channel , Transmission media – Guided as Magnetic, Twisted Pair, coaxial cable, fiber optics etc. , wireless as radiowave ,microwave, infrared

Unit II

Data Link Layer

Framing techniques , Error detection-correction , Multiplexing-TDM ,FDM,WDM ; switching – circuit , message , packet switching , Repeaters, Hubs , Bridges ,switches ,routers and gateways ;Data link protocols-- unrestricted simplex protocol, stop & wait , sliding window ,Go-back- n ,selective repeat, data link layer in internet

Unit III

Medium Access control sublayer

Channel allocation , Multiple access protocols – ALOHA, CSMA ,CSMA /CD ,collision-free protocol
Ethernet- frame format, cabling, encoding, performance, fast Ethernet, gigabit ethernet
Broadband and wireless LAN, bluetooth

Unit IV

Network layer

Connectionless – connection oriented service, comparison of virtual circuit and datagram subnet,
Routing algorithms- shortest path , flooding ,distance vector , hierarchical routing , congestion control and prevention ,Quality of service , network layer in internet- IP protocol and IP address,
IPv6 ,OSPF,BGP routing protocol

Unit V

Transport layer and application layer

Elements of transport protocol, internet transport protocol-UDP / TCP protocol, performance issues-
Network performance measurement, system design for better performance
Domain name system , email ,world wide web- architecture, HTTP

BOOKS RECOMMENDED

[1] Andrew S. Tannenbaum, *Computer Networks*, 4/E Pearson Education, 2003 ,
[2] William Stallings ,*Data and Computer Communications* , 8/E Prentice Hall India, 2007
[3] Behrouz A.Forouzan , *Data Communications and Networking* ,4/E Tata McGraw-Hill, 2000

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic & Telecommunication) V Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET502 **Analog Communication Engineering**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: The course contents are aimed to provide the basics of signals and linear time invariant systems used in communication systems in depth knowledge of different types of analog communication system, different modulation techniques used in these systems behavior of different modulation techniques in presence of noise.

Prerequisite(s): The basic knowledge of Probability Theory**.**

COURSE OF CONTENTS

Unit I

Signals and Systems: Types of Signals - Deterministic & Random, Periodic & Non-Periodic, Analog & Discrete, Energy & Power Signals. Classification of Systems, Fourier series, Fourier Transform & Its Properties, Convolution, Signal Transmission Through LTI Systems, Auto Correlation, Cross Correlation, Energy Power Spectral Density.
Probability, Random Variables & their Moments, their Significance, Gaussian & Rayleigh Probability Density Functions, their Means and Variances, Q-Function, Central Limit Theorem.

Unit II

Amplitude Modulation: Need of Modulation in a Communication System, Block Schematic of a Typical Communication System. AM Modulation System, Modulation Index, Generation (Squire Law & Switching Modulator) & Detection (Envelope & Squire Law Detector) of AM Wave , Side Bands & Power Contents in AM Wave, DSB-SC (Balanced, Ring Modulator & Synchronous Detector), SSB-SC, Its Methods of Generation & Detection, Vestigial Side Band Modulation, Comparison of Various AM Systems, Frequency Division Multiplexing, Group Delay & Phase Delay.

Unit III

Frequency Modulation: Relationships between Phase & Frequency Modulation, Narrowband FM, Wide Band FM & their Spectrum, Transmission Bandwidth of FM And PM Signals, Constant Bandwidth Characteristics of FM, Methods of Generation (Direct & Indirect) & Detection of FM (Discriminators : Balanced, Phase Shift And PLL Detector), Pre- Emphasis & De-Emphasis, Stereophonic FM Broadcasting

Unit IV

AM Transmitter Block Diagram, TRF Receiver & Its Limitations, Necessity of Heterodyning, Super Heterodyne Radio Receivers, IF Amplifiers & Selection Of Intermediate Frequency. FM Transmitters, FM Receivers, AGC, AVC, AFC, Dynamic Range Of Receivers.

Unit V

Sources Of Noise, Noise Figure and Noise Figure Of Amplifiers in Cascade, Noise Bandwidth, Effective Noise Temperature, and Quadrature Components of Noise, Rician Noise as Narrow Band Gaussion Noise. Performance of AM, FM in Presence of Low Noise Case (SNR).
Introduction to Digital Communication: Nyquist Sampling Theorem, Time division Multiplexing, PAM, PWM, PPM.

BOOKS RECOMMENDED

[1] Proakis and Salehi, *Fundamentals of Communication Systems*, 1/E Pearson Education, 2005.
[2] Lathi B.P., *Analog and Digital Communication systems*, 3/E Oxford Press, 2007.
[3] Haykin Simon, *Communication Systems*,4/E John Willey & Sons, 2006.
[4] Carlson , *Communication Systems,* 5/E McGraw Hill, 2004.
[5] Taub & Schilling, *Principles of communication systems*, 3/E McGraw Hill, 2000.
[6] Singh R.P. & Sapre, *Communication systems Analog & Digital*, 2/E TMH, 2007.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic & Telecommunication) V Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET503	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
Analog Electronics	**4**	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: Analysis of transistor using H parameter model and Hybrid π model, Feedback concept applied to Amplifiers and Oscillators and Regulators.

Prerequisite(s): Basics of Semiconductor Theory, KCL, KVL, Knowledge of basic Network Theorems as Nortons, Thevenins, Maximum Power transfer.

COURSE OF CONTENTS

Unit -I

Review of transistor theory, transistor at low frequencies ,two port device and hybrid model ,H-parameters, Emitter follower, comparison of transistor amplifier configurations , linear analysis of transistor circuits, Miller's theorem and its dual , cascading transistor amplifiers, simplified common emitter hybrid model, high input resistance transistor circuits ,biasing problems, Darlington pairs, Bootstrapping.

Unit -II

Transistor at high frequencies, Hybrid π model ,CE short circuit current gain , concept of f_T and f_β and its measurement , current gain with resistive load ,single stage CE transistor amplifier response ,gain band width product, emitter follower at high frequencies. Multi stage amplifiers ,classification of amplifiers , distortions in amplifiers , frequency response of amplifier , Bode plots ,step response of an amplifier, square wave testing , band pass of cascaded stages ,low frequency response of an RC coupled stage , effect of an emitter bypass capacitor on low frequency response.

Unit -III

Feedback amplifiers , classification of amplifiers , concept of feedback ,general characteristics of negative feedback amplifiers , input impedance , out put impedance , topologies, analysis of a feedback amplifier, types of coupling in amplifiers

Unit - IV

Stability and oscillators , effect of feedback on amplifier bandwidth , frequency response of feedback amplifiers, stability , power amplifiers, class A,B,C,AB , their efficiencies , compensation , sinusoidal oscillators , Berkhausen's criteria , Resonant circuit oscillators , Wein bridge , Hartley's, Clapp's , crystal oscillators, push pull amplifiers.

Unit -V

FET , JFET, pinch off , VI characteristics, MOSFET, small signal model , CS and CD amplifiers, biasing techniques ,PMOS, NMOS and CMOS ,application of FET , cascode amplifiers, regulated power supplies, series and shunt voltage regulators, monolithic regulators, switching regulators, regulators using IC's , current regulators and fold back

BOOKS RECOMMENDED

[1] Millman and Halkias, *Integrated electronics*, 4/E TMH, 2004.
[2] Robert Boylested, *Electronics devices and circuits*, 9/E PHI, 2007.
[3] Malvino, *electronics principle*, 6/E PHI, 2007.
[4] B.S.Sonde, *Introduction to System Design Using Integrated Circuits*, 2/E, New Age Publishers, 1992.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic & Telecommunication) V Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET504 **Microcontroller**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: Fundamentals of microcontrollers, Study of 8051 microcontroller, interfacing of various peripherals to microcontroller, building to embedded system.

Prerequisite(s): Fundamental knowledge of Digital Electronics, Microprocessor hardware and Assembly Language Programming.

COURSE OF CONTENTS

Unit I
The 8051 architecture
Microprocessor and Microcontroller, Comparison of microprocessors and microcontrollers Microcontroller survey – microcontrollers of different word length, make and features ,selection criteria for microcontroller ,8051 microcontroller hardware – I/O pins and internal architecture internal RAM,ROM organization , I/O port circuits ,connecting external memory

Unit II
Assembly Language Programming
Addressing modes, data transfer, arithmetic, logical ,branch transfer ,stack and bit related instructions Programming 8051for basic operations, connecting 8255 ,Programming tools and techniques

Unit III
Interrupts
Timer interrupt , serial port interrupt , external interrupt ,reset , interrupt control ,interrupt priority Interrupt destinations ,software generated interrupts, connecting A/D and D/A ,application programs using interrupt.

Unit IV
Counter and timers
Timer modes of operation ,timer counter interrupt ,counter ,serial data transmission ,reception, Serial data transmission modes , programming based on timer application and serial transmission.

Unit V
Interfacing and applications
Scanning programs for small keyboards ,interrupt driven programs ,program for matrix keyboard LCD display ,frequency measurement ,pulse measurement ,multiple interrupts, measurement and control of physical parameter as temperature ,stepper motor control

BOOKS RECOMMENDED

[1] Mazidi Mazidi McKinley, The 8051 *Microcontroller & Embedded system* Using Assembly and C, 2/E Pearson Education, 2006
[2] Kenneth J.Ayala, *The 8051 Microcontroller,* 3/E Penram International, 2007.

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Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET505	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
Linear Devices and application	**4**	**-**	**-**	**Max**	**100**	**50**	**-**	**-**	**150**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**-**	**-**	**60**

Course Objectives: In-depth knowledge of Operational Amplifier including its circuit analysis, design and applications.

Prerequisite(s): Analysis using R- parameter model, Feed-back concept.

COURSE OF CONTENTS

Unit I
Operational amplifier
Introduction ,internal architecture diagram ,differential amplifier-balanced ,unbalanced, level shifter Power amplifier ,Feedback concept , ideal and practical op-amp characteristic ,common-mode-rejection Ratio, offset error voltages and currents

Unit II
Basic op-amp circuits
Designing---Inverting ,noninverting amplifier, adder , subtractor ,voltage follower, integrator differentiator,comparator, zero crossing detector ,Schmitt trigger ,Voltage-to-current, current-to-voltage converter instrumentation amplifier ,logarithmic amplifier,

Unit III
Oscillators and signal generator
Designing -Frequency stability of oscillator , hartley ,colpitt ,crystal , phase shift ,wein's bridge oscillator ,Pulse and square waveform generator ,triangular waveform generator ,sweep frequency generator

Unit IV
Active filters
Low pass, high pass, bandpass, band-reject, all pass filter, first order and higher order filters-
Butterworth ,chybeshev filter,

Unit V
IC voltage regulators
LM-305 ,319 ,723 ,gyrator,NIC convertor

BOOKS RECOMMENDED
[1] Gayakwad R.A, *OpAmps and Linear IC's*, 4/e, Pearson Education, 2006.
[2] Aatre, *Network Theory and Filter Design,* PHI, 2000.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year(Electronic& Telecommunication) V Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3SS506	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
PRINCIPLES OF MANAGEMENT	**2**	**-**	**-**	**Max**	**-**	**50**	**-**	**-**	**50**
Duration of paper: 3 hrs				**Min**	**-**	**25**	**-**	**-**	**25**

Course Objectives: To impart the basics of Management Concepts, Evolution of management as discipline and to deal with different Principles & Functions of Management.

Prerequisite(s): - NIL

COURSE OF CONTENTS

Unit I

The Nature of Management:

Definition and role of management; the function of a manager, Scientific management. Various schools of management thought. The Functions & Principles of management.

Unit II

Planning:

Nature and purpose of planning, Components of planning objective of business.

Unit III

Organization:

Nature and purpose of organizing Structure, Centralization, Decentralization, Span of control, Delegation of authority relationship. Formal and informal organization.

Unit IV

Directions & Staffing:

Direction process, Theories of motivation and leadership, Need analysis, Communication.

Unit V

Control:

Meaning and process of control, techniques of control evaluation, developing and compensating the employees, Merit rating.

BOOKS RECOMMENDED:

[1] Koontz and O'Donnel, Essentials of Management,6/E TMH Jan, 1986
[2] R.D Agrawal, *Organization & Management.*1/E PHI, 1997
[3] PeterDrucker, *Practice of Management, ,*1992
[4] Mc Farland, *Management, Principal and Practice.*
[5] L.M Prasad, *Principal and Practice & Mgt.*
[6] T.N Chhabra, *Principal and Practice & Mgt*,1/E
[7] G.R Terry, *Principal of Management's.*

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Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET551 **Project Phase- I**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	-	**-**	**2**	**Max**	**-**	**-**	**100**	**50**	**150**
				Min	**-**	**-**	**50**	**25**	**75**

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Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET552 **Telecom Networks**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: To give the knowledge about different types of communication networks like PSTN, ISDN, BISDN, their basic structure, applications, communication protocols, switching techniques etc.
To give the concepts of traffic engineering to analyse the communication networks.

Prerequisite(s): Basic knowledge of data communication, layered architecture of communication networks, basics of stochastic process.

COURSE OF CONTENTS

Unit 1 Evolution of Telecommunication, telecommunications standards, introduction to OSI Model, various communication networks, basics of digital communication and transmission, introduction to sampling and pulse code modulation, speed digitization, concept of time division multiplexing, multiplexing hierarchy (T and E carriers), SONET/SDH, Overview of line coding and subscriber line technology.

Unit 2 Switching systems- basics of switching systems, manual switching system, strowger switching system, crossbar switching system, space division switching and time division switching. Types of switching, circuit switching, packet switching.

Unit 3 Telephone Networks (PSTN)- subscriber end instruments, subscriber loop systems, transmission system, signaling system, trunk networks.
Telecommunication Traffic- unit of traffic, network traffic load and parameters, grade of service and blocking probability, modeling switching system, Markov processes, incoming traffic and service time characterization, blocking models and loss estimates.

Unit 4- Introduction to wireless networks- different types of wireless networks (WAN, WMAN, WLAN) Introduction to mobile radio communication- cellular network organization, frequency reuse concepts, operation of cellular system, hand –off.
Introduction to IEEE WLAN, types, protocol architecture, applications. Introduction to Wi-MAX and its applications.

Unit 5- Integrated Services Digital Networks- evolution, basic principles, architecture and reference points, various frame formats, protocol stack, ISDN services.
Broadband ISDN- architecture, protocol stack, cell format, BISDN services.

BOOKS RECOMMENDED:

[1] Thiagrajan Viswanathan, *Telecommunications Switching Systems and Networks*, PHI, 1998.
[2] J.E. Flood, *Telecommunications Switching Traffic and Networks*, Pearson Education, 2004.
[3] W. Stallings, *Wireless Communication and Networks*, Pearson Education Asia, 2001.
[4] W. Stallings*, ISDN and Broad band ISDN with Frame Relay and ATM*, Pearson Education, 2005.
[5] Lathi B.P., *Analog And Digital Communication systems*, Oxford Press, 2001.

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic&Telecommunication Engg.) VI Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET553 **Object Oriented Systems**	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
	4	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of Theory Paper: 3 Hours				**Min**	**35**	**25**	**25**	**25**	**110**

Course Objectives: To familiarize with the Object oriented concepts through Java programming.

Prerequisite(s): Computer Programming

COURSE OF CONTENTS

Unit-I

Introduction to Object Oriented Programming:

Object Oriented Concepts, Merits of Object Oriented Technology. Abstraction, Encapsulation, Information Hiding. Object Model: definition, State, behavior, Identity and messages. Concept of object initialization, constructors, constructor overloading. Access modifiers: Class attributes and methods. Introduction to object model of software development.

Unit-II

Introduction to Java classes and objects:

Java features: Java syntax, data types, data type conversions, control statements, operators and their precedence. Introduction to Class: Instance members and member functions. String Handling, Wrapper classes: Arrays and Vectors.

Unit-III

Inheritance and Polymorphism:

Class relationships: Inheritance and its types, Merits and Demerits. Association. Association inheritance, Polymorphism: Dynamic method dispatch, Runtime polymorphism, Abstract classes, Interfaces and packages.

Unit-IV

Exception Handling and Multithreading:

Exceptions: Need for exceptions, Checked Vs Unchecked exceptions, creating exceptions. Multithreading: Introduction, Priorities and scheduling, Thread Synchronization and its life cycle.

Unit-V

Java I/O, Applets and Event Handling:

Basic concept of streams I/O stream & reader-writer classes. File handling. Applet and its Life Cycle, Basic GUI elements, Event Delegation Model and event handling

BOOKS RECOMMENDED

[1] Cay S.Horstmann, *Core JAVA Vol-1*, 8/E Pearson Education, 2008.
[2] Herbert Schildt, *The complete Reference*, 5/E Tata McGraw Hill, 2002.
[3] Scott W Amber, *The Object Primer*,3/E Cambridge, 2005.
[4] Timothy, Budd, *Object Oriented Programming*, 3/E Pearson Education, 2002.
[5] Kathy Sierra, *Bert Bates, Head First Java*, 2nd Edition, Oreilly

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Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET554	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
Digital Signal Processing	**4**	**-**	**-**	**Max**	**100**	**50**	**-**	**-**	**150**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**-**	**-**	**60**

Objectives: To provide the analysis techniques for discrete time systems analyze the discrete time systems in time and frequency domain using Z- Transform and Fourier transforms to learn the signal processing tool box of MATLAB for implementing the basic problems of DSP designing of digital filters.

Pre-requisites: Awareness about the analysis of analog signals and systems and analog filter design.

COURSE OF CONTENTS

Unit-I
Introduction to signal processing , Discrete time signals and sequence operations ,properties . Discrete time systems ,their properties ,Linear time invariant systems ,convolution ,properties of LTIV systems ,Inverse system ,Linear constant coefficient difference equations and their solutions .,MATLAB exercises

Unit-II
Frequency domain representation of discrete time signals and systems ,suddenly applied complex exponentials inputs , representation of sequences by Fourier transforms , conditions of their convergence ,symmetry properties of the FT, Fourier transform theorems, MATLAB exercises

Unit-III
Introduction to Z- transforms , ROC and their properties , Inverse Z – transform, Z-transform properties ,Initial value theorem ,structures for discrete time systems ,block diagram representation of linear constant coefficient difference equations , Direct form I ,II . signal flow graph representation of LCCDE, basic structures for IIR systems , direct forms,cascade,parallel forms ,transposed forms ,basic structures for FIR systems ,Direct form , cascade form structures for linear phase FIR systems, MATLAB exercises

Unit-IV
Representation of periodic sequences , the discrete Fourier series ,properties of DFS, Fourier transform of periodic signals ,sampling the FT, Fourier representation of finite duration sequences , the discrete Fourier transform ,properties of DFT ,symmetry properties ,circular convolution ,linear convolution using DFT, Implementing LTIV systems using DFT, MATLAB exercises

Unit-V
Efficient computation of DFT , Goertzel algorithm , decimation in time FFT algorithm, In place computation, alternative forms , decimation in frequency FFT algorithm , In place computation, alternative forms. Filter design techniques ,design of discrete time IIR filters from continuous time filters, filter design by impulse invariance , bilinear transformation ,design of FIR filters by windowing ,properties of commonly used windows, MATLAB exercises

BOOKS RECOMMENDED
[1]Oppenheim and Schafer, *Discrete time signal processin*, 2/E PHI, 2005.
[2] Proakis and Manolakis*, Discrete time signal processing*, PHI, 2005.
[3] S. Mitra*, Discrete time signal processing*, Pearson Education.

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Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET555	**L**	**T**	**P**		**TH**	**CW**	**SW**	**PR**	**Total**
Control Systems	**4**	**-**	**2**	**Max**	**100**	**50**	**50**	**50**	**250**
Duration of paper: 3 hrs				**Min**	**35**	**25**	**25**	**25**	**110**

Objective: Is to provide fundamentals of control engineering & the concept of mathematical modeling of the physical system. The subject gives various classical analysis tools for design & stability the systems in time domain & frequency domain.

Prerequisites: Knowledge of Laplace transforms, Basics of Matlab & Simulink

COURSE OF CONTENTS

Unit I

Introduction to the Control System & Modeling

Block diagram, open loop & close loop system, Servomechanism, Feed forward & Feed back control, Digital Control, Multivariable Control System, Non-Linear Control System.

Modeling of Physical Systems, Linear Approximations of Physical Systems, The transfer function, Block Diagram algebra, Signal Flow graphs, Mason's Gain Formula, A.C.& D.C Servomotors, Synchros, Pneumatic & Hydraulic devices for control, Analog computer simulation

Unit II

Time Domain Analysis & Stability

Effect of using feedback, Sensitivity of control systems, Test signals, Time response of prototype First & second order system, Performance specifications of the prototype I & II order system, Effects of additions of poles and zeros to open loop & close loop transfer functions, time response of higher order s, stems & concept of dominant pole, Steady-state error & error constants, Types of controllers & their control action, Stability : BIBO & Zero input, Absolute & relative, Routh Hurwitz criterion, The Root-locus concept, Guidelines for sketching Root-locus, Root contours, Root-locus of systems with Dead time, MATLAB based problems.

Unit III

Frequency Domain Analysis of Control System

Cocept of complex frequency, Performance specification in frequency domain, Co-relation between frequency domain & time domain, Principal of argument, Polar plots, Bode plots, Nicholas Charts, Stability Analysis in Frequency Domain, Nyquist Criteria, stability margins, Relative stability , Systems with dead time, MATLAB based problems.

Unit IV

Design of feedback control systems

Approaches to system design, Cascade compensation networks, Design of Compensators in Time & Frequency domain, MATLAB based problems.

Unit V

State Variable Techniques

State variable representation for an LTI system, Different Canonical forms, Co- relation between state models & Transfer function, Solution of State Equations, Concepts of controllability & observability, MATLAB based problems.

BOOKS RECOMMENDED

[1] B.C. Kuo, *Automatic Control System*, seventh edition , 6/E(PHI), 2006.
[2] Nagrath& Gopal*, Control System Engineering*, 5/E edition - (Newage Publishers), 2007.
[3] M.Gopal, *Control Systems (Principles & Design)* - 5/E (TataMcGraw Hill), 2007.
[4] Bishop & Dorf , *Modem Control System* - (Addison Welseley)

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic & Telecommunication) VI Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3ET556 **Design Workshop**	**L**	**T**	**P**		**Th**	**Cw**	**Sw**	**Pr**	**Total**
	-	**-**	**2**	**Max**	**-**	**-**	**50**	**50**	**100**
Duration of Theory Paper: **Only Internal Test**				**Min**	**-**	**-**	**25**	**25**	**50**

Course Objective: To introduce the Design and Realization of Electronics systems to solve engineering problems; good engineering Design practice; tools and materials relevant to electronics and electrical engineering. To provide initial training in Design skills required by Professional Engineers.

Prerequisites: Understandability of methods for A/D and D/A conversion, including concepts of resolution and accuracy necessary for conversion. Knowledge of Power requirements and efficiency, Power conversion and consumption and power demands of ICs, Supply decoupling. Estimation of power consumption in system from data sheets. Design of simple power supplies.

CONTENT OF COURSE

Unit-I Review
Review of DC Circuits, Active Circuits, Diodes, Bipolar Junction Transistors, Field Effect transistors, Capacitance & Inductance (including transformers), 1st & 2nd order Circuits (overview) Lap lace Transforms (overview), s-Domain Circuit Analysis

Unit-II Power supplies and components
Sources of power. Ideal and practical supplies: regulation. Batteries: primary and secondary, types, capacity and life. AC power supplies: rectification, simple, half-wave and full-wave; need for filter (capacitor) to reduce ripple. Zener diode regulator. Linear regulator circuits; dropout. Power dissipation: heat sinks, thermal resistance, calculation of heat sink required. Switching supplies: principle of operation, configurations. Passive components: specification, construction. Printed circuit boards (PCBs); effect of non-ideal PCB tracks; good grounding practice. Pin-through-hole (PTH) and surface mount (SMD) devices.

Unit-III Analog to digital and digital to analog conversion
Relation between analog and digital data: precision, resolution, range and accuracy. Types of classical analog to digital converters (ADC): successive approximation, pipeline. Reference sources. Signal conditioning, sample-and-hold circuit. Sampling rate, Nyquist criterion, aliasing and need for anti-aliasing filter, over sampling. Sigma–delta converters, principle of operation, effect of over sampling ratio.

Unit-IV Electronic Computer Aided Design
Computer-aided design for electronic circuits, graphical schematic capture, drawing standards for electronic systems, simulation using EDA software available, generation of part lists, printed circuit board layout and production.

Unit-V Electronics Design Project
System Design project: assembly, test and rework of printed circuit board; Design of
Engineering system including analogue, digital and hybrid electronics and real-time software; use of test instruments including generated test patterns; software; integration of hardware and software.

Books Recommended:
[1] P Horowitz and W Hill, *The Art of Electronics*, 2/e Cambridge, 1989
[2] A S Sedra and K C Smith, *Microelectronic Circuits,*5/e Oxford, 2004
[3] B Baker A Baker's Dozen, *Real Analog Solutions for Digital Designers*, Newnes, 2005
[4] W Jung, *Op Amp Applications Handbook,* Newnes, 2005
[5] W Kester, *Mixed-signal and DSP Design Techniques*, Newnes, 2003
[6] W Kester, *Data Conversion Handbook*, Newnes, 2004
[7] R Mancini, *Op Amps for Everyone*, Newnes, 2003
[8] S J Sangwine *Electronic Components and Technology*, StanleyThornes, 1998

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Electronic & Telecommunication) VI Sem					
Subject Code & Name	**Instructions Hours per Week**			**Marks**					
3SS557	**L**	**T**	**P**		**Th**	**Cw**	**Sw**	**Pr**	**Total**
Entrepreneurship Development & IPR	**2**	**-**	**-**	**Max**	**-**	**50**	**-**	**-**	**50**
Duration of Theory Paper: Only Internal Test				**Min**	**-**	**25**	**-**	**-**	**25**

Objectives: To impart the basics of Entrepreneurship development Concepts. To develop the skills of entrepreneurship & to encourage the students to become an entrepreneur. To impart the basics of Intellectual property Rights.

Prerequisites: NIL

COURSE OF CONTENTS

UNIT I
Introduction:
Definition of Entrepreneurship and role of an entrepreneur. Entrepreneurial characteristics, values and attitudes. Entrepreneurship development programmes.

UNIT II
Modes & Methodology of setting up a Small Scale Industry:
Project Identification, Market Survey, Location & Building, Technical Know - How, Raw material & other Utilities, Professional & Skilled Manpower, Project Report, Finance, Whom to Approach.

UNIT III
Institutional Support to Entrepreneurs:
Need for Institutional support different Government & Non Government institutions to support Entrepreneurs like, NSIC, SIDO, SSIB, SSIDC, SISIs , DTICs, industrial Estates, Specialized Institutions. Registration of a small scale Industry.

UNIT IV
Intellectual Property Rights:
Introduction of IPR, various perspective of IPR like Innovation & Creation, Innovators & Creators, Sharing of Knowledge, Trade Marks etc. General Provisions & Basic principles of IPR.

UNIT V
Patents:
Definitions, Need for a patents, what can be patented, Patent laws, Rights of Patent Holders, Filing of a Patent, Industrial Scenario.

BOOKS RECOMMENDED:
[1] Colombo plan staff college for Technician Education, Manila , *Entrepreneurship Development*, Tata *McGrawHill 1998*
[2] N.K. Acharya, *Text book on intellectual Property Rights*, Asha Law House New Delhi, New Edition, 2001.