TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING -R17

COURSE STRUCTURE & SYLLABUS

III YEAR I SEMESTER

S.No	Course Code	Course Title	L	T	P	Credits
1	**A45PC1**	Electromagnetic Theory and Transmission Lines	**4**	**1**	**0**	**4**
2	**A45PC2**	Linear & Digital IC Applications	**4**	**1**	**0**	**4**
3	**A45PC3**	Digital Communications	**4**	**1**	**0**	**4**
4	**A45HS4**	Fundamentals of Management	**3**	**1**	**0**	**3**
5	**A45OE5**	**Open Elective-I**	**3**	**1**	**0**	**3**
6	**A45PE6**	**Professional Elective-I** 1. Digital Design Using Verilog HDL 2. Information Security 3. Design of Fault Tolerant Systems	**4**	**1**	**0**	**3**
7	**A45PC7**	Linear IC Applications Lab	**0**	**0**	**3**	**2**
8	**A45PC8**	Digital IC Applications Lab	**0**	**0**	**3**	**2**
9	**A45PC9**	Digital Communications Lab	**0**	**0**	**3**	**2**
10	**A45MC5**	Professional Ethics	**3**	**0**	**0**	**0**
Total Credits						**27**

III YEAR II SEMESTER

S.No	Course Code	Course Title	L	T	P	Credits
1	**A46PC1**	Antennas and Wave Propagation	**4**	**1**	**0**	**4**
2	**A46PC2**	Microprocessors and Microcontrollers	**4**	**1**	**0**	**4**
3	**A46PC3**	Digital Signal Processing	**4**	**1**	**0**	**4**
4	**A46PE4**	**Professional Elective-II** 1. Digital Image Processing 2. Spread Spectrum Communications 3. Digital system Design	**3**	**0**	**0**	**3**
5	**A46PE5**	**Professional Elective-III** VLSI Design Multimedia & Signal Coding Optical Communications	**3**	**1**	**0**	**3**
6	**A46OE6**	**Open Elective-II**	**3**	**1**	**0**	**3**
7	**A46PC7**	Digital Signal Processing Lab	**0**	**0**	**3**	**2**
8	**A46PC8**	Microprocessors and Microcontrollers Lab	**0**	**0**	**3**	**2**
9	**A46HS9**	Advanced English Communication Skills Lab	**0**	**0**	**3**	**2**
Total Credits						**27**

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES -A45PC1

B. Tech: III Year I Semester **L/T/P/ C**
4/1/0/ 4

COURSE OBJECTIVES:

This is a structured foundation course, dealing with concepts, formulations and applications of Electromagnetic Theory and Transmission Lines, and is the basic primer for all electronic communication engineering subjects. The main objectives of the course are:

1. To explain the basics of electrostatic and magneto static concepts and show the time varying electromagnetic fields as applied to high frequency circuit design.
2. To interpret the electromagnetic wave characteristics at interface of different boundaries.
3. To illustrate the importance of transmission line theory and applications of it to circuit design with the help of Smith chart.
4. To understand the basic concepts of guided waves.

COURSE OUTCOMES:

Upon completion of the Course, the students will be able to

1. Analyze the electric fields due to different charge distributions and analyze the electric fields in different mediums.
2. Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions, and use them for solving engineering problems.
3. Analyze the EM wave propagation and attenuation in various media and analyze the importance of pointing theorem.
4. Determine the Transmission Line parameters for different lines characterize the distortions and estimate the characteristics for different lines.
5. Choose smith chart to design transmission lines, to find the reflection coefficient for given impedance and vice versa.

UNIT – I:

Electrostatics: Introduction to coordinate systems and Vector analysis. Coulomb's Law, Electric Field Intensity - Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density. Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance - Parallel Plate, Coaxial, Spherical Capacitors, Illustrative Problems.

UNIT – II:

Magnetostatics: Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magneto static Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law.

Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer EMF, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary Surface : Dielectric-Dielectric and Dielectric- Conductor Interfaces.

UNIT – III:

EM Wave Characteristics - I: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves - Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics- Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization.

EM Wave Characteristics - II: Reflection and Refraction of Plane Waves - Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem - Application.

UNIT – IV:

Transmission Lines - I: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Loss lessness/Low Loss Characterization, Distortion - Condition for Distortion lessness and Minimum Attenuation, Loading - Types of Loading.

UNIT – V:

Transmission Lines - II: Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines - Impedance Transformations, Significance of Z_{min} and Z_{max} , Smith Chart - Configuration and Applications, Single Matching.

Guided Waves: Propagation of TE, TM and TEM waves between Parallel planes.

TEXT BOOKS

1. Principles of Electromagnetics - Matthew N.O. sadiku and S.V. Kulkarni, 4th Ed., Oxford University Press, Aisan Edition, 2015.
2. Electromagnetic Waves and Radiating Systems - E.C. Jordan and K.G. Balmain, 2nd Ed. 2000, PHI.
3. Transmission Lines and Networks - UmeshSinha, SatyaPrakashan, 2001, (Tech. India Publications), New Delhi.

REFERENCE BOOKS

1. Engineering Electromagnetics - Nathan Ida, 2nd Ed., 2005, Springer (India) Pvt. Ltd., New Delhi.
2. Networks, Lines and Fields - John D. Ryder, 2nd Ed., 1999, PHI.
3. Engineering Electromagnetics - William H. Hayt Jr. and John A. Buck, 7th Ed., 2006, McGraw Hill Education.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

LINEAR & DIGITAL IC APPLICATIONS -A45PC2

B.Tech III Year I Semester **L/T/P/C 4/1/0/4**

COURSE OBJECTIVES:

The main objectives of course are to:

1. Introduce the IC fabrication process and basic building blocks of linear integrated circuits.
2. Introduce theory and applications of active filters, waveform generators, multivibrators & PLL.
3. Familiarize the theory of DAC and ADC and designing problems.
4. Understand and implement various combinational logic circuits using IC's.
5. Implement various sequential circuits using IC's and to provide strong knowledge about memories and their types.

COURSE OUTCOMES:

On completion of this course, the students will be able to:

1. Design circuits using operational amplifiers for various applications.
2. Analyze and design active filters, waveform generators, multi vibrators and PLL using IC's.
3. Acquires knowledge to design different types of ADC's and DAC's.
4. Design different combinational logic circuits using TTL and CMOS IC's.
5. Acquires knowledge about different memories and design of various sequential circuits.

UNIT – I:

Operational Amplifier: IC Fabrication steps, classification of ICs ,Ideal and practical OP-Amps, OP-Amps characteristics, DC and AC characteristics ,features of 741 Op Amp, Modes of operation Inverting and Non-inverting, Differential amplifier, Adder and Subtractor, Instrumentation amplifier, Integrator and differentiator, Comparators, Schmitt Trigger, introduction to voltage regulator, features of 723 regulator, three terminal regulators.

UNIT – II:

Op-Amp, IC-555 & IC-565 Applications: Introduction to active filters, Characteristics of Band pass, Band reject and All pass filters, Analysis of 1st order LPF, HPF butter worth filters, waveform generators: Sine wave generator- RC and Wien Bridge, Triangular, saw tooth and Square wave generators, IC 555 timer functional diagram, mono stable and Astable operations and applications, IC 565 PLL- block schematic, description of individual blocks, applications.

UNIT – III:

Data Convertors: Introduction, basic DAC techniques, different types of DACs-weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC, DAC and ADC Specifications. Illustrative problems.

UNIT – IV:

Digital Integrated Circuits: Classification of Integrated circuits, Comparison of Various logic families, CMOS, transmission gate IC interfacing-TTL driving CMOS & CMOS driving TTL,Combinational Logic ICs-specifications and Application of TTL 74XX ICs-Code converters, Decoders, Demultiplexers, Encoders, parity Encoders, Multiplexers, parity generators/checkers circuits, parallel Binary adders & Subtractors, Magnitude Comparators.

UNIT – V:

Sequential Logic IC'S: Families with commonly available 74XX & CMOS 40XX Series ICs-All types of Flip-flops, Synchronous Counters, Decade counters, Shift register.

Memories: Types of ROMS & Applications, RAM Architecture, Static & Dynamic RAMs.

Programmable Logic Devices: PLA, PAL & PROM Architectures.

TEXT BOOKS

1. OP-Amp and Linear ICs - Ramakanth A Gayakwad, PHI, 2003.
2. Linear Integrated Circuits - D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2003.
3. Digital Design Principles& Practices-John F.Wakerly, PHI/Preason Education Asia, 3rd ED., 2005.

REFERENCE BOOKS

1. Linear Integrated Circuits Application by K. Lal Kishore, Pearson Edition, 2005.
2. Modern digital electronics-RP Jain 4/e-McGraw Hill Education, 2010.
3. Design with operational amplifiers & Analog Integrated circuits -Sergio Franco, McGraw Hill, 3rd Edition, 2002.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL COMMUNICATIONS -A45PC3

B.Tech III Year I Semester **L/T/P/C 4/1/0/4**

COURSE OBJECTIVES:

1. To understand the functional block diagram of Digital Communication system.
2. To understand the various digital modulation techniques.
3. To understand a mathematical model of Digital Communication system for bit error rate analysis of different Digital Communication systems.
4. To study various source and channel coding techniques.
5. To study the performance of spread spectrum modulation.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to:

1. Analyze the basic digital modulation techniques such as PCM, DM etc., and understand the concepts of sampling.
2. Understand the concepts of different Shift Keying techniques.
3. Understand the basics of information theory and analyze the error performance, design optimum receivers for digital modulation techniques.
4. Understand about different error detection and correcting codes like block codes, cyclic codes, and convolutional codes.
5. Analyze the performance of Spread Spectrum and Noise.

UNIT – I:

Elements Of Digital Communication Systems: Model of Digital communication systems, Digital representation of Analog signal, certain issues in Digital transmission, Advantages of digital communication systems, Sampling Theorem, Types of sampling- impulse sampling, natural sampling, flat-top sampling, Introduction to Base band sampling.

Waveform Coding Techniques: PCM generation and reconstruction, Quantization noise, Non uniform quantization and companding, DPCM, Adaptive DPCM, DM and Adaptive DM, Noise in PCM and DM.

UNIT – II:

Digital Modulation Techniques: Introduction, ASK, ASK modulator, Coherent ASK detector, Non-coherent ASK detector, FSK, Bandwidth and Frequency spectrum of FSK, Non coherent FSK detector, Coherent FSK detector, FSK detection using PLL, BPSK, Coherent PSK Detection, QPSK, 8-PSK, 16-PSK, Differential PSK, QAM.

UNIT – III:

Information Theory: Information and Entropy, Conditional Entropy and Redundancy, Shannon-Fano coding, mutual information, Information loss due to noise, source coding-Huffman code, Variable length coding, Lempel-Ziv coding, source coding to increase average information per bit,Lossy source coding, Bandwidth-S/N tradeoff, Hartley Shannon Law.

Baseband Pulse Transmission: Introduction, Matched filter, Error rate due to noise, Inter symbol interference, Nyquist's criterion for distortion less baseband binary transmission, eye patterns.

Digital Pass band Transmission: Pass band transmission model, probability of error, correlation receiver.

UNIT – IV:

Error Control Codes: Linear Block Codes: Matrix description of linear block codes, Error detection and correction capabilities of linear block codes.

Cyclic Codes: Algebraic structure, Encoding, syndrome calculation, Decoding.

Convolution Codes: Encoding, Decoding: using state, Tree, Trellis diagrams, Decoding using Viterbi algorithm.

UNIT – V:

Spread Spectrum Modulation: Use of spread spectrum, direct sequence spread spectrum (DSSS), Code division Multiple Access, Ranging using DSSS, Frequency hopping spread spectrum, PN-sequences: Generation and characteristics, Synchronization in spread spectrum systems.

TEXT BOOKS

1. Digital communication - Simon Haykin, John Wiley, 4 th edition, 2009.
2. Digital and analog communication systems-Sam Shanmugam, John Wiley, 2005.
3. Digital communications - Bernard sklar and Pabitra Kumar Ray-Pearson, 2nd Edition, 2009.

REFERENCE BOOKS

1. Principles of Communication Systems-Herbert Taub, Donald L schilling, Goutham Saha, 3rd Edition, McGraw Hill Education, 2008.
2. Electronic Communication systems, Wayne tomasi, 5th Edition, Pearson Education.
3. Communication Systems - Analog and Digital, R.P.Singh, S.Sapre, McGraw Hill Education, 2012.
4. Digital Communications - John G.Proakis, Masoud Salehi-5th edition, McGraw Hill Education, 2008.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

FUNDAMENTALS OF MANAGEMENT -A45HS4

B. Tech III Year I Semester **L/T/P/C**
3/1/0/3

COURSE OBJECTIVE: To understand the Management Concepts, applications of Concepts in Practical aspects of business and development of Managerial Skills.

COURSE OUTCOME: The students understand the significance of Management in their Profession. The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course. The students can explore the Management Practices in their domain area.

UNIT – I:

Introduction to Management: Definition, Nature and Scope, Functions, Managerial Roles, Levels of Management, Managerial Skills, Challenges of Management; Evolution of Management- Classical Approach- Scientific and Administrative Management; The Behavioral approach.

UNIT – II:

Planning and Decision Making: General Framework for Planning - Planning Process, Types of Plans. Decision making and Problem solving - Programmed and Non Programmed Decisions, Steps in Problem Solving and Decision Making.

UNIT – III:

Organization and HRM: Principles of Organization: Organizational Design & Organizational Structures; Departmentalization, Delegation; Empowerment, Centralization, Decentralization, Recentralization; Stress Management and Counseling, Management of change Human Resource Management & Business Strategy: Talent Management, Talent Management Models and Strategic Human Resource Planning; Recruitment and Selection; Training and Development; Performance Appraisal.

UNIT – IV:

Leading and Motivation: Leadership, Power and Authority, Leadership Styles; Behavioral Leadership, Situational Leadership, Leadership Skills, Leader as Mentor and Coach, Leadership during adversity and Crisis.

Motivation - Types of Motivation; Motivational Theories - Needs Hierarchy Theory, Two Factor Theory, Theory X and Theory Y.

UNIT – V:

Controlling: Control, Types and Strategies for Control, Steps in Control Process, Budgetary and Non-Budgetary Controls. Characteristics of Effective Controls.

TEXT BOOKS

1. Management Fundamentals, Robert N Lussier, 5e, Cengage Learning, 2013.
2. Fundamentals of Management, Stephen P. Robbins, Pearson Education, 2009.

REFERENCE BOOKS

1. Essentials of Management, Koontz Kleihrich, Tata Mc - Graw Hill.
2. Management Essentials, Andrew DuBrin, 9e, Cengage Learning, 2012.
3. Harold Koontz and Heinz Weihrich, 2010, Essentials of Management, TMH.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL DESIGN USING VERILOG HDL -A45PE6

B.Tech III Year I Semester **L/T/P/C**
3/1/0/3

COURSE OBJECTIVES:

1. To build Verilog design modules using the constructs and conventions of the Verilog HDL programming language and various modeling styles supported by the language.
2. To distinguish between the various modeling styles like structural, register-transfer (data flow), and algorithmic (behavioral) and make use of various levels of abstraction for modeling digital hardware systems.
3. To develop advanced complex systems for real time environment and to develop required skill set in this programming language to foster the needs of the industry.

COURSE OUTCOMES: On completion of this course, the students will be able to:

1. Describe, design, simulate, and synthesize computer hardware using the Verilog hardware description language.
2. Describe the role of hardware description language (HDL) in design flows for FPGA and ASIC with a historical development of the Verilog HDL.
3. Develop program codes for structural, behavioral and data flow modeling of combinational and sequential logic using Verilog HDL in any problem identification formulation and solution.
4. Complete tasks and assignments effectively as instructed with the use of modern technology through research and case studies.
5. Interpret and Implement designs using the advanced features of Verilog HDL and be able to write code effectively.

UNIT – I:

Introduction To VLSI Design: Introduction, conventional approach to digital design, VLSI/ASIC design flow, Role of HDL.

Introduction To Verilog: Verilog as HDL, Emergence of HDLs, Capabilities of Verilog HDL, Levels of Design Description, Hierarchical Modeling Concepts.

Language Constructs and Conventions: Introduction, Keywords, Identifiers, White Space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data Types, Scalars, Vectors and Arrays, Memories, Expressions, Operands and Operators, Parameters, System Tasks, Compiler Directives, Modules and Ports, Modeling Styles

UNIT – II:

Gate Level Modeling: Introduction, Gate Types - AND/OR Gates, BUF/NOT Gates, Tri-state Gates, Array of Instances of Gate Primitives, Net Delays and Gate Delays, Rise, Fall and Turn-off Delays, Min/Typ/Max Values, Delay Examples, Strengths and Contention Resolution, Verilog Design Examples Using Gate Level Modeling.

UNIT – III:

Data Flow Modeling: Introduction, Continuous Assignments, Delays, Expressions, Operands and Operators, Operator Types, Verilog Design Examples Using Data Flow Modeling.

UNIT-IV:

Switch Level Modeling: Introduction, Switch-Modeling Elements - MOS Switches, CMOS Switches, Bidirectional Switches, Power and Ground, Resistive Switches, Delay Specification on

Switches, Verilog Design Examples Using Switch Level Modeling.

Behavioral Modeling: Introduction, Structures Procedures - Initial and Always Statements, Procedural Assignments, Timing Controls, Conditional Statements, Multiway Branching, Loops, Sequential and Parallel Blocks, Generate Blocks, Procedural Continuous Assignments, Test Benches, Verilog Design Examples Using Behavioral Modeling.

UNIT – V:

Tasks, Functions and User Defined Primitives: Differences between Tasks and Functions, Declaration and Invocation, Examples, UDP Basics, Combinational UDPs, Sequential UDPS. Design Exercises: Design using Finite State Machine (Moore and Mealy Machines).

TEXT BOOKS

1. T. R. Padmanabhan, B. Bala Tripura Sundari (2004), Design through Verilog HDL, Wiley & Sons Education, IEEE Press, USA.
2. Samir Palnitkar (2013), Verilog HDL - A Guide to Digital Design and Synthesis, 2nd Edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS

1. Michael D. Ciletti (2005), Advanced Digital Design with Verilog HDL, Prentice Hall of India, New Delhi.
2. Stephen. Brown, Zvonko Vranesic (2005), Fundamentals of Logic Design with Verilog, Tata McGraw Hill, India.
3. J. Bhaskar (2003), A Verilog Primier, 2 nd edition, BS Publications, India.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

INFORMATION SECURITY -A45PC6

B.Tech III Year I Semester **L/T/P/ C**
3/1/0/3

COURSE OBJECTIVES:

1. Explain the objectives of information security
2. Explain the importance and application of each of confidentiality, integrity, authentication and availability
3. Understand various cryptographic algorithms.
4. Understand the basic categories of threats to computers and networks
5. Describe public-key cryptosystem and enhancements made to IPv4 by IPSec
6. Understand Intrusions and intrusion detection
7. Discuss the fundamental ideas of public-key cryptography, Web security and Firewalls.
8. Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.

COURSE OUTCOMES:

On completion of this course, the students will be able to:

1. To understand basic cryptographic a algorithms, message and web authentication and security issues.
2. Ability to identify information system requirements for both of them such as client and server.
3. Ability to understand the current legal issues towards information security.

UNIT – I:

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, stenography, key range and key size, possible types of attacks.

UNIT – II:

Symmetric key Ciphers: Block Cipher principles & Algorithms (DES, AES, Blowfish), Differential and Linear Crypt analysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution

Asymmetric key Ciphers: Principles of public key cryp to systems, Algorithms (RSA, Diffie-Hellman, ECC), Key Distribution.

UNIT – III:

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm

Authentication Applications: Kerberos,X.509 Authentication Service,Public- Key Infrastructure, Biometric Authentication.

UNIT-IV:

E-Mail Security: Pretty Good Privacy, S/MIME

IP Security: IP security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, key management.

UNIT – V:

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction

Intruders, virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, Countermeasures, Firewall design principles, types of firewalls

Case Studies on Cryptography and security: Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual E lections

TEXT BOOKS

1.Cryptography and Network Security: William Stallings, Pearson Education,4th Edition.
2.Cryptography and Network Security: Atul Kahate, McGraw Hill Edition.

REFERENCE BOOKS

1. Cryptography and Network Security: C K Shyamala, N Harin i, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security: Forouzan Mukhopadhyay, MC Graw Hill, 2nd Edition.
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH.
5. Introduction to Network Security: Neal Krawetz, Cengage Learning.
6. Network Security and Cryptography: Bernard Menezes, Cengage Learning.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DESIGN OF FAULT TOLERANT SYSTEMS -A45PE6

B. Tech III Year I Semester **L/T/P/ C 3/1/0/3**

COURSE OBJECTIVES:

1. To provide or broad understanding of fault diagnosis and tolerant design Approach.
2. To illustrate the framework of test pattern generation using semi and full automatic approach.

COURSE OUTCOMES:

On completion of this course, the students will be able to:

1. To acquire the knowledge of fundamental concepts in fault tolerant design.
2. Design requirements of self-check-in circuits
3. Test pattern generation using LFSR
4. Design for testability rules and techniques for combinational circuits
5. Introducing scan architectures.

UNIT – I:

Fault Tolerant Design: Basic concepts: Reliability concepts, Failures & faults, Reliability and Failure rate, Relation between reliability and mean time between failure, maintainability and availability, reliability of series, parallel and parallel-series combinational circuits.

Fault Tolerant Design: Basic concepts-static, dynamic, hybrid, triple modular redundant system (TMR), 5MR reconfiguration techniques, Data redundancy, Time redundancy and software Redundancy concepts. [TEXTBOOK-1]

UNIT – II:

Self-Checking circuits & Fail safe Design: Self Checking Circuits: Basic concepts of self-checking circuits, Design of Totally self-checking checker, Checkers using m out of n codes, Berger code, Low cost residue code.

Fail Safe Design: Strongly fault secure circuits, fail safe design of sequential circuits using partition theory and Berger code, totally self-checking PLA design. [TEXTBOOK-1]

UNIT – III:

Design for Testability: Design for testability for combinational circuits: Basic concepts of Testability, Controllability and observability, The Reed Muller's expansion technique, use of control and syndrome testable designs.

Design for Testability by means of Scan: Making circuits Testable, Testability Insertion, Full scan DFT technique- Full scan insertion, flip- flop Structures, Full scan design and Test, Scan Architectures-full scan design, Shadow register DFT, Partial scan methods, multiple scan design, other scan designs. [TEXTBOOK-2]

UNIT – IV:

Logic Built-In-Self-Test (BIST): BIST Basics-Memory-based BIST, BIST effectiveness, BIST types, Designing a BIST, Test Pattern Generation-Engaging TPGs, exhaustive counters, ring counters, twisted ring counter, Linear feedback shift register, Output Response Analysis-Engaging ORA's, One's counter, transition counter, parity checking, Serial LFSRs, Parallel Signature analysis, BIST architectures - BIST related terminologies, A centralized and separate Board-level BIST architecture, Built-in evaluation and self test(BEST), Random Test socket(RTS), LSSD On-chip self test, Self -testing using MISR and SRSG, Concurrent BIST, BILBO, Enhancing coverage, RT level BIST design- CUT design, simulation and synthesis, RTS BIST insertion, Configuring the RTS BIST, incorporating configurations in BIST, Design of STUMPS, RTS and STUMPS results. [TEXTBOOK-2]

UNIT – V:

Standard IEEE Test Access Methods: Boundary Scan Basics, Boundary scan architecture- Test access port, Boundary scan registers, TAP controller, the decoder unit, select and other units, Boundary scan Test Instructions- Mandatory instructions, Board level scan chain structure -One serial scan chain, multiple-scan chain with one control test port, multiple-scan chains with one TDI,TDO but multiple TMS, Multiple-scan chain, multiple access port, RT Level boundary scan-inserting boundary scan test hardware for CUT, Two module test case, virtual boundary scan tester, Boundary Scan Description language. [TEXTBOOK-2]

TEXTBOOKS

1. Fault Tolerant & Fault Testable Hardware Design- Parag K. Lala, 1984,PHI
2. Digital System Test and Testable Design using HDL models and Architectures - Zainalabedin Navabi, Springer International Edition.

REFERENCE BOOKS

1. Digital Systems Testing and Testable Design-Miron Abramovici, Melvin A.Breuer and Arthur D. Friedman, Jaico Books.
2. Essentials of Electronic Testing- Bushnell & Vishwani D. Agarwal, Springers.
3. Design for Test for Digital IC's and Embedded Core Systems- Alfred L. Crouch, 2008, Pearson Education.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

LINEAR IC APPLICATIONS LAB -A45PC7

B.Tech III Year I Semester **L/T/P/ C**
0/0/3/2

COURSE OBJECTIVES:

1. The main aim of this lab is to teach the linear and non-linear applications of operational amplifiers (741).
2. Students are made familiar with theory and applications of 555 timers.
3. Students are made familiar with theory and applications of 565 PLL.
4. Students are made familiar with voltage regulators using 78xx, 79xx and IC 723.
5. Students are made to Design Digital to Analog circuits.

COURSE OUTCOMES:

Upon the completion of Lab, student will be able to:

1. Acquires the knowledge of operational amplifier (741).
2. Design circuits using operational amplifiers for various applications.
3. Design circuits using IC 555 and IC 565 for various applications.
4. Design circuits using voltage regulators for various applications.

NOTE:

1. To perform any twelve experiments.
2. Verify the functionality of the IC in the given application.

Design and Implementation of:

1. Inverting and Non-inverting Amplifiers using Op Amps.
2. Adder, Subtractor and Comparators using Op Amp.
3. Integrator Circuit using IC 741.
4. Differentiator circuit using Op Amp.
5. Active Filter Applications - LPF, HPF (first order)
6. IC 741 Waveform Generators - Sine, Square wave and Triangular waves.
7. Mono-stable Multivibrator using IC 555.
8. A stable Multi vibrator using IC 555.
9. Schmitt Trigger Circuits - using IC 741.
10. IC 565 - PLL Applications.
11. Voltage Regulator using IC 723.
12. Three Terminal Voltage Regulators -7805, 7809, 7912.
13. Digital to Analog Converter Using R-2R Ladder Network.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL IC APPLICATIONS LAB -A45PC8

B.Tech III Year I Semester **L/T/P/ C**
0/0/3/2

COURSE OBJECTIVES:

1. To study the sequential logic circuits design both in synchronous and Asynchronous modes for various complex logic and switching devices, their minimization techniques and their realizations.
2. Knowledge of the methods for analysis and synthesis of combinational and sequential circuits.
3. To study the theory and applications of 74XX combinational and sequential series IC's.

COURSE OUTCOMES:

On completion of this lab course the students will be able to:

1. Acquires the knowledge of 74XX IC's.
2. Design various combinational & sequential circuits using various Digital ICs.
3. Acquires the knowledge of differentiating between Linear and Digital IC's.
4. Acquires the knowledge of demonstrating by designing digital circuits

Note:

1. To perform any twelve experiments.
2. Verify the functionality of the IC in the given application.

LIST OF EXPERIMENTS

Design and Implementation of:

1. Design a16x4 priority encoder using two 8x3 priority encoder.
2. Design a 16bit comparator using 4 bit comparators.
3. Design a model to 53 counter using two decade counters.
4. Design 450 KHz clock using NAND/NOR gates.
5. Design a 4 bit pseudo random sequence generator using 4-bit ring counter.
6. Design a 16*1 multiplexer using 8x1 multiplexer.
7. Design a 16 bit Adder/ Subtractor using 4-bit Adder /Subtractor IC's.
8. Plot the transform characteristics of 74H, LS, HS series IC's.
9. Deign a 4-bit Gray to Binary and Binary to Gray Convertor.
10. Design a two Digit 7segment display unit using the Mod counter output of experiment 3.
11. Design an 8 bit parallel load and serial out shift register using two 4 bit shift register.
12. Design an 8 bit serial in and serial out shift register using two 4 bit shift register.
13. Deign a Ring counter and twisted ring counter using a 4-bit shift register.
14. Design a 4 digit hex counter using synchronous one digit hex counters.
15. Design a 4 digit hex counter using Asynchronous one digit hex counters.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL COMMUNICATIONS LAB -A45PC9

B.Tech III Year I Semester **L/T/P/ C**
0/0/3/2

COURSE OBJECTIVE:

This course gives students deep knowledge in digital communication systems at the practical level.

1. This lab focuses the fundamental concepts on TDM, Pulse modulation Techniques.
2. To analyze various digital modulation techniques like ASK, FSK, PSK, DPSK and QPSK
3. To understand the concept of ISI & OFDM.

COURSE OUTCOMES:

On completion of this lab course the students will be able to

1. Understand basic theories of Digital communication system in practical.
2. Design and implement different Pulse modulation and demodulation techniques
3. Analyze digital modulation techniques
4. Identify and describe different techniques in modern digital communications, in particular source coding techniques.
5. Perform different multiplexing techniques

NOTE: Perform any twelve experiments & Hardware Testing to be done

LIST OF EXPERIMENTS

1. PCM Generation and Detection
2. Differential Pulse Code Modulation
3. Delta Modulation
4. Adaptive Delta modulation
5. Time Division Multiplexing of 2 Band Limited Signals
6. Frequency Shift Keying: Generation and Detection
7. Phase Shift Keying: Generation and Detection
8. Amplitude Shift Keying: Generation and Detection
9. Study of the spectral characteristics of PAM
10. Study of the spectral characteristics of PWM
11. Study of the spectral characteristics of QAM.
12. DPSK: Generation and Detection.
13. QPSK: Generation and Detection
14. OFDM: Generation and Detection

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

PROFESSIONAL ETHICS -A45MC5

B.Tech III Year I Semester **L/T/P/ C**
3/0/0/0

COURSE OBJECTIVES:

1. To enable the students to imbibe and internalize the professional ethics.
2. To understand ethical behavior in the personal and professional life.
3. It is an essential for professionals in any field to have an understanding of The ethical problems.
4. To enable the engineering students to know several major professions.
5. To have an adequate knowledge about MNC'S and business environment.

COURSE OUTCOMES:

1. The student will understand the importance of values and ethics in their personal lives and professional carrier.
2. The student will learn the rights and responsibility as an employee, team member and a global citizen.
3. They will have the ability to excel in competitive and challenging environment.
4. Ability to solve the problems of business environment.
5. To learn more of responsibility and rights as professional and facing global challenges.

UNIT – I:

Introduction to Professional Ethics: Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Professional Success, Ethics and Profession

UNIT – II:

Basic Theories: Basic Ethical Principles, Moral Developments, Deontology, Utilitarianism, Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral Pluralism, Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy.

UNIT – III:

Professional Practices in Engineering: Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession.

UNIT – IV:

Central Responsibilities of Engineers - The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.Work Place Rights & Responsibilities, Ethics in changing domains of Research, Engineers and Managers.

UNIT – V:

Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, Business Ethics and Corporate Governance, Ethics in Manufacturing and Marketing, Media Ethics.

TEXT BOOKS

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ethics in Engineering Practice & Research, Caroline Whit beck, 2e, Cambridge University Press 2015.

REFERENCE BOOKS

1. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e , Cengage learning, 2015.
2. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008.
3. Marianne moody Jennings, "The Legal, Ethical and Global Environment of Business" Sharma, J.P. Business Ethics & CSR, Ane Books Pvt Ltd, New Delhi.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

ANTENNAS AND WAVE PROPAGATION -A46PC1
(Professional Elective - III)

B.Tech III Year II Semester **L/T/P/ C**
4/1/0/4

COURSE OBJECTIVES:

This can be termed a middle level course in the electronic communication engineering domain. The course deals with antenna basics, different types of antennas, some design features, antenna measurements and wave propagation, and has the following main Objectives

1. To understand the basic parameters of the antenna to derive the radiation characteristics of wire antennas.
2. To distinguish between UHF, VHF and Microwave antennas, their requirements, specifications, characteristics and design relations.
3. To determine the characteristics of linear and nonlinear arrays and Extension to planner arrays.
4. Be acquainted with wave propagation basics.

COURSE OUTCOMES:

Upon completion of this course, the students will be able to:

1. Explain the basic parameters of the antenna and sketch their pattern to dipole and loop antennas.
2. Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of folded dipole, Yagi-Uda Antenna, Helical Antennas, Horn Antennas, and to acquire the knowledge of their analysis, design and development.
3. Analyze a micro strip rectangular patch antenna and a parabolic reflector antenna, identify the requirements and relevant feed structure, carry out the design and establish their patterns.
4. Carry out the Linear Array Analysis, Binomial Arrays and Planar arrays. Specify the requirements for microwave measurements
5. Classify the different wave propagation mechanisms, identify their frequency ranges, determine the characteristic features of ground wave, ionospheric wave, space wave, duct and tropospheric propagations, and estimate the parameters involved.

UNIT – I:

Antenna Basics: Introduction, Basic Antenna Parameters - Patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity-Gain-Resolution, Antenna Apertures, Effective Height, Friis transmission equation. Fields from Oscillating Dipole, Field Zones, Front - to-back Ratio, Antenna Theorems, Radiation, Retarded Potentials - Helmholtz Theorem

Thin Linear Wire Antennas - Radiation from Small Electric Dipole, Quarter Wave Monopole and Half Wave Dipole - Current Distributions, Field Components, Radiated Power, Radiation Resistance, Beam Width, Directivity, Effective Area and Effective Height, Natural Current Distributions, Far Fields and Patterns of Thin Linear Centre-fed Antennas of Different Lengths. Loop Antennas - Introduction, Small Loop, Comparison of Far Fields of Small Loop and Short Dipole, Radiation Resistances and Directivities of Small Loops (Qualitative Treatment).

UNIT – II:

VHF, UHF and Microwave Antennas - I : Arrays with Parasitic Elements, Yagi-Uda Array, Folded Dipoles and their Characteristics, Helical Antennas - Helical Geometry, Helix Modes, Practical Design Considerations for Mono filar Helical Antenna in Axial and Normal Modes, Horn Antennas - Types, Fermat's Principle, Optimum Horns, Design Considerations of Pyramidal Horns.

UNIT – III:

VHF, UHF and Microwave Antennas - II: Micro strip Antennas - Introduction, Features, Advantages and Limitations, Rectangular Patch Antennas - Geometry and Parameters, Characteristics of Microstrip Antennas. Reflector Antennas - Introduction, Flar Sheet and Corner Reflectors, Paraboloidal Reflectors - Geometry, Pattern Characteristics, Feed Methods, Reflector Types - Related Features.

UNIT – IV:

Antenna Arrays: Point Sources - Definition, Patterns**,** arrays of 2 Isotropic Sources - Different Cases, Principle of Pattern Multiplication, Uniform Linear Arrays - Broadside Arrays, End fire Arrays, EFA with Increased Directivity, Derivation of their Characteristics and Comparison, BSAs with Non-uniform Amplitude Distributions - General Considerations and Binomial Arrays, Planar arrays (Qualitative treatment).

Antenna Measurements: Introduction, Concepts - Reciprocity, Near and Far Fields, Coordinate System, Sources of Errors. Patterns to be Measured, Directivity Measurement, Gain Measurements (by Comparison, Absolute and 3-Antenna Methods)

UNIT – V:

Wave Propagation - I: Introduction, Definitions, Categorizations and General Classifications, Different Modes of Wave Propagation, Ray/Mode Concepts, Ground Wave Propagation (Qualitative Treatment) - Introduction, Plane Earth Reflections, Space and Surface Waves, Wave Tilt, Curved Earth Reflections. Space Wave Propagation - Introduction, Field Strength Variation with Distance and Height, Effect of Earth's Curvature, Absorption, Super Refraction, M-Curves and Duct Propagation, Scattering Phenomena, Troposphere Propagation.

Wave Propagation - II: Sky Wave Propagation - Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path, Critical Frequency, MUF, LUF, OF, Virtual Height and Skip Distance, Relation between MUF and Skip Distance, Multi-hop Propagation.

TEXT BOOKS

1. Antennas and Wave Propagation - J.D. Kraus, R.J. Marhefka and Ahmad S. Khan, McGraw Hill Education, New Delhi, 4th ed., (Special Indian Edition), 2010.
2. Electromagnetic Waves and Radiating Systems - E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

REFERENCE BOOKS

1. Antenna Theory - C.A. Balanis, John Wiley & Sons, 3rd Ed., 2005.
2. Antennas and Wave Propagation - K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

MICROPROCESSORS AND MICROCONTROLLERS -A46PC2

(Professional Elective - III)

B.Tech III Year II Semester **L/T/P/ C**
4/1/0/4

COURSE OBJECTIVES:

To develop an understanding of the operations of microprocessors and micro controllers; machine language programming and interfacing techniques.

COURSE OUTCOMES:

Upon completion of this course the student will be able to:

1. Acquire the knowledge of internal architecture, organization of 8086 and can develop assembly language programming.
2. Acquire the knowledge of internal architecture, organization of 8051 and can develop assembly language programming.
3. Acquire the knowledge of interfacing techniques to 8086 and 8051 and can develop assembly language programming to design microprocessors/microcontroller based systems.
4. Acquire the knowledge of stands the internal architecture and organization of ARM processors/controllers and can develop assembly language programming.
5. Acquire the knowledge of internal architecture and organization of Advanced ARM Processors.

UNIT – I:

8086 Architecture: 8086 Architecture-Functional diagram, Register Organization,8086 Flag register and function of 8086 flags, Memory Segmentation, Programming Model, Memory addresses, Physical Memory Organization, Architecture of 8086, Pin diagram of 8086, Signal descriptions of 8086-common function signals, minimum and maximum mode signals, Timing diagrams, Interrupts of 8086.

Instruction Set and Assembly Language Programming of 8086: Instruction formats, addressing modes, Instruction Set, Assembler Directives, Macros, and Simple Programs involving Logical, Branch and Call Instructions, Sorting, String Manipulations.

UNIT – II:

Introduction to Microcontrollers: Overview of 8051 Microcontroller, Architecture, I/O Ports, Memory Organization, Addressing Modes and Instruction set of 8051.

8051 Real Time Control: Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Programming 8051 Timers and Counter.

UNIT – III:

I/O and Memory Interface: 8255 PPI, Stepper motor interfacing to 8086, LCD, Keyboard, External Memory RAM, ROM Interface, ADC, DAC Interface to 8051.

Serial Communication and Bus Interface: Serial Communication Standards, Serial DataTransfer Scheme, On board Communication Interfaces-I2C Bus, SPI Bus, UART; External Communication Interfaces-RS232, USB.

UNIT – IV:

ARM Architecture: ARM Processor fundamentals, ARM Architecture - Register, CPSR, Pipeline, exceptions and interrupts interrupt vector table, ARM instruction set - Data processing, Branch instructions, load store instructions, Software interrupt instructions, Program status register instructions, loading constants, Conditional execution, Introduction to Thumb instructions.

UNIT – V:

Advanced ARM Processors: Introduction to CORTEX Processor and its architecture, OMAP Processor and its Architecture.

TEXT BOOKS

1. Advanced Microprocessors and Peripherals - A. K. Ray and K.M. Bhurchandani, MHE, 2nd Edition 2006.
2. The 8051 Microcontroller, Kenneth. J. Ayala, Cengage Learning, 3rd Ed.
3. ARM System Developers guide, Andrew N SLOSS, Dominic SYMES, Chris WRIGHT, Elsevier, 2012.

REFERENCE BOOKS

1. Microprocessors and Interfacing, D. V. Hall, MGH, 2nd Edition 2006.
2. Introduction to Embedded Systems, Shibu K.V, MHE, 2009.
3. The 8051Microcontrollers, Architecture and Programming and Applications -K.Uma Rao, Andhe Pallavi, Pearson, 2009.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL SIGNAL PROCESSING -A46PC3

B.Tech III Year II Semester **L/T/P/C 4/1/0/4**

COURSE OBJECTIVES:

The objective of this subject is to

1. Provide background and fundamental material for the analysis and processing ofdigital signals.
2. Study fundamentals of time, frequency and Z plane analysis and to discuss the inter relationships of these analytic method.
3. Study the design and structures of digital filters from analysis to synthesis for a given specifications.
4. Acquaint in FFT algorithms, multi rate signal processing techniques and finite word length effects.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to

1. Acquire knowledge on various types of continuous and discrete time signals, solves linear constant coefficient difference equation also can realize digital filters.
2. Calculate time domain and frequency domain of signals using DFS, DFT and develop FFT Algorithm for faster realization of signals and systems
3. Design digital IIR filters from analog filters using various techniques.
4. Design digital FIR filters using Window techniques, Fourier methods and frequency sampling techniques.
5. Design Interpolator and Decimator, knows the impacts of Finite Word Length Effects in Filter design.

UNIT – I:

Introduction: Introduction to Digital Signal Processing, Applications, Discrete time signals & sequences, linear shift invariant systems, stability, and causality. Linear constant coefficient difference equations, Frequency domain representation of discrete time signals and systems.

Z-Transforms: Review of Z-transforms, Applications of Z - transforms, solution of difference equations of digital filters, system function, stability criterion, frequency response of stable systems.

UNIT – II:

Discrete Fourier Transforms: Properties of discrete Fourier series, DFS representation of periodic sequences, Discrete Fourier transforms: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT: Over-lap save, Over-lap add methods, Relation between DTFT, DFS and Z-transform.

Fast Fourier Transforms: Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT, and FFT for composite N, Linear filtering approach for computing DFT.

UNIT – III:

IIR Digital Filters: Analog filter approximations - Butter worth and Chebyshev, Design of IIR Digital filters from analog filters-Backward difference algorithm, Step and Impulse invariant techniques, bilinear transformation method, spectral transformations, Realization of IIR Digital filters, applications.

UNIT – IV:

FIR Digital Filters: Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Fourier series method, Window Techniques, Frequency Sampling technique, Realization of FIR Digital filters, Comparison of IIR & FIR filters.

UNIT – V:

Multirate Digital Signal Processing: Introduction, Down Sampling, Decimation, Up sampling, Interpolation, sampling rate conversion, Multistage implementation of Interpolator and Decimator, Applications.

Finite Word Length Effects: Limit cycles, Overflow oscillations, Round-off noise in IIR digital filters, computational output round off noise, Methods to prevent overflow. Trade off between round off and overflow noise, Dead band effects.

TEXT BOOKS

1. Digital Signal Processing, Principles, Algorithms, and Applications: John G. Proakis, Dimitris G. Manolakis, Pearson Education / PHI, 2007.
2. Discrete Time Signal Processing-A.V. Oppenheim and R.W. Schaffer, PHI, 2009.
3. Digital Signal processing -Tarun Kumar Rawat, Oxford University Press, 2015.

REFERENCE BOOKS

1. Analog and Digital Signal Processing by Ashok Ambardar -2nd Edition, Brooks/Cole Publishing Company,2006
2. Digital Signal processing-S. Shalivahanan, A.Vallavaraj and C. Gnanapriya, TMH, 2009.
3. Fundamentals of Digital Signal processing- Loney Ludeman, John Wiley.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL IMAGE PROCESSING -A46PE4
(Professional Elective - II)

B.Tech III Year II Semester **L/T/P/ C**
3/0/0/3

COURSE OBJECTIVES:

The objectives of the course are:

1. Knowledge about the fundamentals of image processing and the applications of various transforms for several applications.
2. Improvement of image quality using image enhancement techniques in spatial domain and frequency domain with examples and its applications.
3. Recovery of degraded images with different restoration filters
4. Analyzing image by segmentation and applications of morphological processing.
5. Image compression methods to reduce the data of image with various coding techniques.

COURSE OUTCOMES:

Upon successfully completing the course, students will be able to

1. Acquire knowledge on Digital image fundamentals and Image Transforms.
2. Apply best enhancement techniques to improve image.
3. Know how to restore a degraded image.
4. Obtain knowledge on various segmentation methods and morphological image processing.
5. Apply various image compression methods to reduce image data.

UNIT – I:

Digital Image Fundamentals: Digital Image Fundamentals, Sampling and quantization, Relationship between pixels.

Image Transforms: 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform.

UNIT – II:

Image Enhancement (Spatial Domain): Introduction, Image enhancement in spatial domain, enhancement through point operation, types of Point processing, Histogram manipulation, linear and non-linear gray level transformation, local or neighborhood operation, median filter, Spatial domain high-pass filtering.

Image Enhancement (Frequency Domain): filtering in frequency domain, obtaining frequency domain filters from spatial domain filters, generating filters directly in the frequency domain, low pass and high pass filters in frequency domain.

UNIT – III:

Image Restoration: Degradation model, Algebraic approach to restoration, Inverse filtering, least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-IV:

Image Segmentation: Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

Morphological Image Processing: Dilation and erosion, Dilation: structuring element decomposition, Erosion, combining dilation & Erosion, Opening and closing, The Hit or Miss Transformation.

UNIT – V:

Image Compression: Redundancies and their removal methods, Fidelity criteria, Image compression models, Huffman and Arithmetic coding, Error free compression, Lossy compression, Lossy and Lossless Predictive Coding, Transformation based Compression, JPEG 2000 Standard.

TEXT BOOKS

1. Digital Image processing - R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education
2. Digital Image processing - S. Jayaraman, S. Esakkirajan, T. Veerakumar-TMH 2010.
3. Digital Image Processing - William K. Pratt, John Wilely, 3rd Edition, 2004.

REFERENCE BOOKS

1. Digital Image processing using MATLAB-Rafael C. Gonzalez, Richard E Woods and Steven.L Edition, PEA, 2004.
2. "Fundamentals of Digital Image Processing" Anil K Jain.
3. Fundamentals of Electronic Image Processing - Weeks Jr., SPIC/IEEE Series, PHI.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

SPREAD SPECTRUM COMMUNICATIONS -A46PE4
(Professional Elective - II)

B.Tech III Year II Semester **L/T/P/ C**
3/0/0/3

COURSE OBJECTIVES:

The objectives of this course are to make the student

1. Understand the concept of Spread Spectrum and study various types of Spread spectrum sequences and their generation.
2. Understand the principles of Code Division Multiple Access (CDMA) and use of Spread spectrum concept in CDMA
3. Understand various Code tracing loops for optimum tracking of wideband signals viz spread spectrum signals
4. Understand the procedure for synchronization of receiver for receiving the Spread spectrum signal.
5. Study the performance of spread spectrum systems in Jamming environment, systems with Forward Error Correction and Multiuser detection in CDMA cellular radio.

COURSE OUTCOMES:

On completion of this course student will be able to

1. Generate various types of Spread spectrum sequences and can simulate CDMA system (Both Transmitter & Receiver).
2. Analyze the performance of Spread spectrum systems in Jamming environment and systems with Forward Error Correction.
3. Can provide detection and cancellation schemes for Multiusers in CDMA cellular radio.

UNIT – I:

Introduction to Spread Spectrum Systems: Fundamental Concepts of Spread Spectrum Systems, Pseudo Noise Sequences, Direct Sequence Spread Spectrum, Frequency Hop Spread Spectrum, Hybrid Direct Sequence Frequency Hop Spread Spectrum, Code Division Multiple Access.

Binary Shift Register Sequences for Spread Spectrum Systems: Introduction, Definitions, Mathematical Background and Sequence Generator Fundamentals, Maximal Length Sequences, Gold Codes.

UNIT – II:

Code Tracking Loops: Introduction, Optimum Tracking of Wideband Signals, Base Band Delay-Lock Tracking Loop, Tau-Dither Non- Coherent Tracking Loop, Double Dither Non-Coherent Tracking Loop.

UNIT – III:

Initial Synchronization of the Receiver Spreading Code: Introduction, Problem Definition and the Optimum Synchronizer, Serial Search Synchronization Techniques, Synchronization using a Matched Filter, Synchronization by Estimated the Received Spreading Code.

UNIT – IV:

Cellular Code Division Multiple Access (CDMA) Principles: Introduction, Wide Band Mobile Channel, the Cellular CDMA System, Single User Receiver in a Multi User Channel, CDMA System Capacity. Multi-User Detection in CDMA Cellular Radio: Optimal Multi-User Detection,

Linear Suboptimal Detectors, Interference Combat Detection Schemes, Interference Cancellation Techniques.

UNIT – V:

Performance of Spread Spectrum Systems in Jamming Environments: Spread Spectrum Communication System Model, Performance of Spread Spectrum Systems without Coding. Performance of Spread Spectrum Systems with Forward Error Correction: Elementary Block Coding Concepts, Optimum Decoding Rule, Calculation of Error Probability, Elementary Convolution Coding Concepts, Viterbi Algorithm, Decoding and Bit-Error Rate.

TEXT BOOKS

1. Rodger E Ziemer, Roger L. Peterson and David E Borth - "Introduction to Spread Spectrum Communication- Pearson, 1st Edition, 1995.
2. Mosa Ali Abu-Rgheff - "Introduction to CDMA Wireless Communications." Elsevier Publications, 2008.

REFERENCE BOOKS

1. George R. Cooper, Clare D. Mc Gillem - "Modern Communication and Spread Spectrum," McGraw Hill, 1986.
2. Andrew j. Viterbi - "CDMA: Principles of spread spectrum communication," Pearson Education, 1st Edition, 1995.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL SYSTEM DESIGN -A46PE4
(Professional Elective - II)

B.Tech III Year II Semester **L/T/P/ C**
3/0/0/3

COURSE OBJECTIVES:

1. To provide extended knowledge of digital logic circuits in the form of state model approach and to provide an overview of system design approach using programmable logic devices.
2. To provide and understand of fault models and test methods.

COURSE OUTCOMES:

On completion of this course, the students will be able to:

1. To exposes the design approaches using ROM's, PAL's and PLA's. To provide in depth understanding of Fault models.
2. To understands test pattern generation techniques for fault detection. To design fault diagnosis in sequential circuits.

UNIT – I:

Minimization and Transformation of Sequential Machines: The Finite State Model - Capabilities and limitations of FSM - State equivalence and machine minimization - Simplification of incompletely specified machines. Fundamental mode model - Flow table - State reduction - Minimal closed covers - Races, Cycles and Hazards.

UNIT – II:

Digital Design: Digital Design Using ROMs, PALs and PLAs, BCD Adder, 32 - bit adder, State graphs for control circuits, Scoreboard and Controller, A shift and add multiplier, Array multiplier, Keypad Scanner, Binary divider.

UNIT – III:

SM Charts: State machine charts, Derivation of SM Charts, Realization of SM Chart, Implementation of Binary Multiplier, dice game controller.

UNIT – IV:

Fault Modeling & Test Pattern Generation: Logic Fault model - Fault detection & Redundancy- Fault equivalence and fault location -Fault dominance - Single stuck at fault model - Multiple stuck at fault models -Bridging fault model.

Fault diagnosis of combinational circuits by conventional methods - Path sensitization techniques, Boolean Difference method - Kohavi algorithm - Test algorithms - D algorithm, PODEM, Random testing, Transition count testing, Signature analysis and test bridging faults.

UNIT – V:

Fault Diagnosis in Sequential Circuits: Circuit Test Approach, Transition Check Approach - State identification and fault detection experiment, Machine identification, Design of fault detection experiment

TEXT BOOKS

1. Fundamentals of Logic Design - Charles H. Roth, 5th ed., Cengage Learning.
2. Digital Systems Testing and Testable Design - Miron Abramovici, Melvin A. Breuer and Arthur D. Friedman- John Wiley & Sons Inc.

REFERENCE BOOKS

1. Switching and Finite Automata Theory - Z. Kohavi , 2nd ed., 2001, McGraw Hill Education.
2. Digital Design - Morris Mano, M.D.Ciletti, 4th Edition, Pearson.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

VLSI DESIGN -A46PE5

(Professional Elective - III)

B.Tech III Year II Semester **L/T/P/ C**
3/1/0/3

COURSE OBJECTIVES:

1. Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors. Acquires knowledge about basic electrical properties of MOS.
2. Preparing the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit.
3. Designing of different types of logic gates using CMOS logic and analyze their transfer characteristics.
4. Provide design concepts required to design data path building blocks and memories.
5. Design logic circuits using PLA, PAL, FPGA and CPLD. Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system.

COURSE OUTCOMES:

Upon successfully completing the course, students will be able to:

1. Acquire qualitative knowledge about the fabrication of MOS transistors.
2. Design layout of any logic circuit with proper design rules.
3. Implement transistor level circuits for equivalent logic circuits.
4. Design sub systems like data, control and memory modules.
5. Implement any logic circuit using various Programmable Logic Devices.

UNIT – I:

Introduction to IC Technology: Introduction, MOS, PMOS, NMOS, CMOS & BiCMOS technologies.

Basic Electrical Properties: Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT – II:

VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 µ m CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

UNIT – III:

Gate Level Design: Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, time delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers.

UNIT – IV:

Data Path Subsystems: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.

Array Subsystems: SRAM, DRAM, ROM, Serial access memories.

UNIT – V:

Programmable Logic Devices: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach, parameters influencing low power design.

CMOS Testing: CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques.

TEXT BOOKS

1. Essentials of VLSI circuits and systems - Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition.
2. CMOS VLSI Design -a circuits and systems perspective, Neil H.E. Weste, David Harris, Ayan Banerjee, Peason, 2009.
3. VLSI Design-M.Michael Val, 2001, CRC Press.

REFERENCE BOOKS

1. Introduction to VLSI Systems: A Logic, Circuit and systems Perspective-Ming-BO Lin, CRC Press, 2011.
2. CMOS logic circuit Design - John.P.Uyemura, Springer, 2007.
3. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

MULTIMEDIA & SIGNAL CODING -A46PE5
(Professional Elective - III)

B.Tech III Year II Semester **L/T/P/ C**
3/1/0/3

COURSE OBJECTIVES:

This course introduces

1. The basic concepts of Multimedia, fundamentals of Color in Image and Video, Compression Algorithms.
2. Image, Video Compression Techniques and Audio Compression required supporting multimedia requirements.
3. Emphasis on the topics of Computer and Multimedia Networks Multimedia Network Communications and Applications is laid.

COURSE OUTCOMES:

The completion of course enables

1. To understand the basics of Multimedia, Color models of Image and Video, Compression of Image, Video and Audio,
2. To demonstrate the knowledge of Computer and Multimedia Networks Multimedia Network Communications and Applications.

UNIT – I:

Introduction to Multimedia: Multimedia. World Wide Web. Overview of multimedia tools, Multimedia authoring, Graphics/ image data types, and file formats.

Color in Image and Video: Color Science - Image Formation, Camera Systems, Gamma Correction, Color Matching Functions, CIE Chromaticity Diagram, Color Monitor Specifications, Out-of-Gamut colors. White point corrections, XYZ to RGB transform. Transform with Gamma Correction, L*a*b* Color model.

Color Models in Images - RGB color model for CRT displays. Subtractive

Color: CMY Color model, Transformation from RGB to CMY. Under color removal: CMYK System, printer Gamuts.

UNIT – II:

Color Models in Video: Video Color Transforms. YUV color model, YIQ color model, YCbCr Color Model

Video Concepts: Types of video signals. Analog video. Digital Video.

Audio Concepts: Digitization of sound, Quantization and Transmission of audio.

UNIT – III:

Compression Algorithms: Lossless compression algorithms: Run length coding, Variable length coding. Arithmetic coding, Lossless JPEG, Image Compression.

Lossy Image Compression Algorithms: Transform Coding: KLT and DCT Coding, Wavelet based coding.

Image Compression Standards: JPEG and JPEG2O00.

UNIT – IV:

Video Compression Techniques: Introduction to Video Compression. Video Compression based on Motion Compensation. Search for motion vectors. H.261- Intra-frame and Inter-frame coding, Quantization, Encoder and Decoder, Overview of MPEG 1 andMPEG2.

Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders - Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP, Hybrid Excitation Vocoders, MPEG Audio - MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression algorithms, MPEG-2 AAC, MPEG-4 Audio.

UNIT – V:

Computer and Multimedia Networks: Basics of Computer and Multimedia networks, Multiplexing technologies, LAN and WAN Access networks.

Multimedia Network Communications and Applications: Quality of Multimedia data transmission, multimedia over IP, Multimedia over ATM networks, Transport of MPEG4, Media on Demand.

TEXT BOOKS

1. Fundamentals of Multimedia - Ze- Nian Li, Mark S. Drew, PHI, 2010.
2. Multimedia Signals & Systems - Mrinal Kr. Mandal Springer International Edition 1st Edition, 2009.

REFERENCE BOOKS

1. Multimedia Communication Systems - Techniques, Stds & Netwroks K.R. Rao, Zorans. Bojkoric, Dragorad A. Milovanovic, 1st Edition,2002.
2. Fundamentals of Multimedia Ze- Nian Li, Mark S.Drew, Pearson Education (LPE), 1st Edition, 2009.
3. Multimedia Systems John F. Koegel Bufond Pearson Education (LPE), 1st Edition, 2003.
4. Digital Video Processing - A. Murat Tekalp, PHI, 1996.
5. Video Processing and Communications-Yaowang, Jorn Ostermann, Ya-Qin Zhang, Pearson, 2002.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

OPTICAL COMMUNICATIONS -A46PE5
(Professional Elective - III)

B.Tech III Year II Semester **L/T/P/ C**
3/1/0/3

COURSE OBJECTIVES:

1. Introductions and the basic elements, of optical fiber transmission link, fiber modes configurations and structures.
2. To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
3. To learn the various optical source, detectors and optical fiber connectors.
4. To learn the concept of WDM, optical fiber communication system design.

COURSE OUTCOMES:

Student should be able to

1. Understand the importance, introductions and the basic elements, of optical fiber transmission link, fiber modes configurations and structures.
2. Understands the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
3. Demonstrate the ability to design a system, with the knowledge of optical components as per needs and specifications.

UNIT – I:

Overview of Optical Fiber Communication: Historical development, The general system, advantages of optical fiber communications. Optical fiber wave guides- Introduction, Ray theory transmission, Total Internal Reflection, Acceptance angle, Numerical Aperture, Skew rays. Cylindrical fibers- Modes, Vnumber, Mode coupling, Step Index fibers, Graded Index fibers. Single mode fibers- Cut off wavelength, Mode Field Diameter, Effective Refractive Index. Fiber materials - Glass, Halide, Active glass, Chalgenide glass, Plastic optical fibers.

UNIT – II:

Signal Distortion in Optical Fibers: Attenuation, Absorption, Scattering and Bending losses, Core and Cladding losses. Information capacity determination, Group delay, Types of Dispersion - Material dispersion, Wave- guide dispersion, Polarization mode dispersion, Intermodal dispersion, Pulse broadening. Optical fiber Connectors- Connector types, Single mode fiber connectors, Connector return loss. Fiber Splicing- Splicing techniques, splicing single mode fibers. Fiber alignment and joint loss- Multimode fiber joints, single mode fiber joints.

UNIT – III:

Optical Sources: LEDs, Structures, Materials, Quantum efficiency, Power, Modulation, Power bandwidth product. Injection Laser Diodes- Modes, Threshold conditions, External quantum efficiency, Laser diode rate equations, Resonant frequencies. Reliability of LED & ILD. Source to fiber power launching - Output patterns, Power coupling, Power launching, Equilibrium Numerical Aperture, Laser diode to fiber coupling.

UNIT – IV:

Optical Detectors: Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparison of Photo detectors. Optical receiver operation- Fundamental receiver operation, Digital signal transmission, error sources, Receiver configuration, Digital receiver performance, Probability of error, Quantum limit, Analog receivers.

UNIT – V:

Optical System Design: Considerations, Component choice, Multiplexing. Point-to- point links, System considerations, Link power budget with examples. Overall fiber dispersion in Multi mode and Single mode fibers, Rise time budget with examples. Transmission distance, Line coding in Optical links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye pattern.

TEXT BOOKS

1. Optical Fiber Communications - Gerd Keiser, Mc Graw-Hill International edition, 4th Edition, 2000.
2. Optical Fiber Communications - John M. Senior, PHI, 3rd Edition, 2009.

REFERENCE BOOKS

1. Optical Communication systems-John Gowar, 2nd edition, PHI, 2001
2. Fiber Optic Communications - D.K. Mynbaev , S.C. Gupta and Lowell L. Scheiner, Pearson Education, 2005.
3. Text Book on Optical Fibre Communication and its Applications - S.C.Gupta, PHI, 2005.
4. Fiber Optic Communication Systems - Govind P. Agarwal, John Wiley, 3rd Edition, 2004.
5. Fiber Optic Communications - Joseph C. Palais, 4th Edition, Pearson Education, 2004.
6. Introduction to fiber optics by Donald J.Sterling, cengage learning, 2004.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

DIGITAL SIGNAL PROCESSING LAB -A46PC7

B.Tech III Year II Semester **L/T/P/ C**
0/0/3/2

COURSE OBJECTIVES:

This subject aims to:

1. Use the Fast Fourier Transform in a variety of applications including signal analysis, fast convolution, spectral and temporal interpolation, and filtering.
2. Quickly choose and design digital filters
3. estimate power spectral densities using a variety of techniques
4. perform the convolution of two signals
5. construct a simple digital communication system

COURSE OUTCOMES:

Upon completion of the Lab students will be able to:

1. Analyze sequence using the discrete Fourier transform (DFT).
2. Understand the Decimation in time and frequency FFT algorithms for efficient computation of the DFT.
3. Obtain the spectrum of a signal and study the Histogram.
4. Alter the sampling rate of a signal using decimation and interpolation.
5. Design digital IIR filters by designing prototypical analog filters and then applying analog to digital conversion techniques such as the bilinear transformation.
6. Design digital FIR filters using the window method

NOTE:

1. The Programs shall be implemented in Software (Using MATLAB / Lab View / C Programming/ Equivalent) and Hardware (Using TI / Analog Devices / Motorola / Equivalent DSP processors).
2. Minimum of 12 experiments to be conducted

LIST OF EXPERIMENTS

1. Generation of Sinusoidal Waveform / Signal based on Recursive Difference Equations
2. Histogram of White Gaussian Noise and Uniformly Distributed Noise.
3. To find DFT / IDFT of given DT Signal
4. To find Frequency Response of a given System given in Transfer Function/ Differential equation form.
5. Obtain Fourier series coefficients by formula and using FET and compare for half sine wave.
6. Implementation of FFT of given Sequence
7. Determination of Power Spectrum of a given Signal(s).
8. Implementation of LP FIR Filter for a given Sequence/Signal.

9. Implementation of HP IIR Filter for a given Sequence/Signal
10. Generation of Narrow Band Signal through Filtering
11. Generation of DTMF Signals
12. Implementation of Decimation Process
13. Implementation of Interpolation Process
14. Implementation of I/D Sampling Rate Converters
15. Impulse Response of First order and Second Order Systems.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

MICROPROCESSORS AND MICROCONTROLLERS LAB -A46PC8

B.Tech III Year II Semester **L/T/P/ C**
0/0/3/2

COURSE OBJECTIVES:

To develop an understanding of the operations of microprocessors and micro controllers; machine language programming and interfacing techniques.

COURSE OUTCOMES:

Upon completion of this Lab the student will be able to:

1. Apply the fundamentals of assembly level programming for microprocessors /microcontrollers.
2. Develop programs on a microprocessor using instruction set of 8086.
3. Develop the assembly level programming using 8051 instruction set.
4. Analyze different I/O devices which can be interfaced to microprocessor and microcontroller.
5. Develop programs using instruction set of ARM.

Note: - Minimum of 12 experiments to be conducted.

The following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051kits.

LIST OF EXPERIMENTS

1. Programs for 16 bit arithmetic operations 8086(using various addressing modes)
2. Programs for sorting an array for 8086.
3. Programs for searching for a number of characters in a string for8086.
4. Programs for string manipulation for8086.
5. Programs for digital clock design using8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessor kits using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify Timer/Counter in8051.
12. Program and verify interrupt handling in8051.
13. UART operation in8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to8051
16. Interfacing Matrix/Keyboard to8051
17. Data transfer from peripheral to memory through DMA controller8237/8257.
18. Programs for arithmetic operations using ARM7 2148 plus.
19. Program for Digital output (blink LEDs) using ARM7 2148 plus.

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING-R17

ADVANCED ENGLISH COMMUNICATION SKILLS LAB -A46HS9

B.Tech III Year II Semester **L/T/P/ C**
0/0/3/2

INTRODUCTION

A course on *Advanced English Communication Skills (AECS) Lab* is considered essential at the third year level of B.Tech and B.Pharmacy courses. At this stage, the students need to prepare themselves for their career which requires them to listen to, read, speak and write in English both for their professional and interpersonal communication. The main purpose of this course is to prepare the students of Engineering for their placements.

COURSE OBJECTIVES:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

1. To improve students' fluency in spoken English
2. To enable them to listen to English spoken at normal conversational speed
3. To help students develop their vocabulary
4. To read and comprehend texts in different contexts
5. To communicate their ideas relevantly and coherently in writing
6. To make students industry-ready
7. To help students acquire behavioral skills for their personal and professional life
8. To respond appropriately in different socio-cultural and professional contexts

COURSE OUTCOMES:

Students will be able to:

1. Acquire vocabulary and use it contextually
2. Listen and speak effectively
3. Develop proficiency in academic reading and writing
4. Increase possibilities of job prospects
5. Communicate confidently in formal and informal contexts

Syllabus

The following course activities will be conducted as part of the Advanced English Communication Skills (AECS) Lab:

1. **Inter-personal Communication and Building Vocabulary** - Starting a Conversation - Responding Appropriately and Relevantly - Using Appropriate Body Language - Role Play in Different Situations - Synonyms and Antonyms, One-word Substitutes, Prefixes and Suffixes, Idioms and Phrases and Collocations.
2. **Reading Comprehension** -General Vs Local Comprehension, Reading for Facts, Guessing Meanings from Context, , Skimming, Scanning, Inferring Meaning.
3. **Writing Skills** - Structure and Presentation of Different Types of Writing - Letter

Writing/Resume Writing/ e-correspondence/ Technical Report Writing.

4. **Presentation Skills** - Oral Presentations (individual or group) through JAM Sessions/Seminars/ PPTs and Written Presentations through Posters/Projects/Reports/e-mails /Assignments… etc.,
5. **Group Discussion and Interview Skills** - Dynamics of Group Discussion, Intervention, Summarizing, Modulation of Voice, Body Language, Relevance, Fluency and Organization of Ideas and Rubrics of Evaluation- Concept and Process, Pre-interview Planning, Opening Strategies, Answering Strategies, Interview through Tele-conference & Video-conference and Mock Interviews.

Minimum Hardware Requirement: Advanced English Communication Skills (AECS) Laboratory shall have the following infrastructural facilities to accommodate at least 35 students in the lab:

1. **Spacious room with appropriate acoustics**
2. **Eight round tables with five movable chairs for each table. Audio visual aids**
3. **LCD Projector**
4. **Public Address system**
5. **Computer with suitable configuration**

Suggested Software: The software consisting of the prescribed topics elaborated above should be procured and used.

1. **Oxford Advanced Learner's Compass**, 8th Edition
2. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill practice.**

REFERENCE BOOKS

1. Kumar, Sanjay and Pushp Lata. ***English for Effective Communication***, Oxford University Press, 2015.
2. Konar, Nira. ***English Language Laboratories - A Comprehensive Manual,*** PHI Learning Pvt. Ltd., 2011.