ANNA UNIVERSITY TIRUCHIRAPPALLI

Tiruchirappalli - 620 024

Syllabus

B.Tech. Information Technology

SEMSETER III

MATHEMATICS III

(Common to all branches)

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UNIT I PARTIAL DIFFERENTIAL EQUATIONS **9**

Formation of Partial Differential Equations by Elimination of Arbitrary Constants and Arbitrary Functions – Solution of Standard Types of First Order Partial Differential Equations – Lagrange's Linear Equation – Linear Partial Differential Equations of Second and Higher Order with Constant Coefficients.

UNIT II FOURIER SERIES **9**

Dirichlet's Conditions – General Fourier Series – Odd and Even Functions – Half Range Sine Series – Half Range Cosine Series – Complex Form of Fourier Series – Parseval's Identity – Harmonic Analysis.

UNIT III BOUNDARY VALUE PROBLEMS **9**

Classification of Second Order Quasi Linear Partial Differential Equations – Solutions of One Dimensional Wave Equation – One Dimensional Heat Equation – Steady State Solution of Two-Dimensional Heat Equation (Insulated edges excluded) – Fourier Series Solutions in Cartesian Coordinates.

UNIT IV FOURIER TRANSFORM **9**

Fourier Integral Theorem (without proof) – Fourier Transform Pair – Sine and Cosine Transforms – Properties – Transforms of Simple Functions – Convolution Theorem – Parseval's Identity.

UNIT V Z - RANSFORM AND DIFFERENCE EQUATIONS **9**

Z-Transform – Elementary Properties – Inverse Z-Transform – Convolution Theorem – Formation of Difference Equations – Solution of Difference Equations using Z-Transform.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, Fortieth Edition, 2007.

REFERENCES

1. Churchill R.V. and Brown J.W., "Fourier Series and Boundary Value Problems", Fourth Edition, McGraw-Hill Book Co., 1987.
2. Veerarajan .T, "Engineering Mathematics III", Third edition, Tata McGraw-Hill Education, 2007.
3. Kandasamy P., Thilagavathy K. and Gunavathy K., "Engineering Mathematics Volume III", S. Chand & Company ltd., 1996.

SIGNALS AND SYSTEMS

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UNIT I REPRESENTATION OF SIGNALS 9

Continuous and Discrete Time Signals: Classification of Signals – Periodic – Aperiodic Even – Odd – Energy and Power Signals – Deterministic and Random Signals – Complex Exponential and Sinusoidal Signals – Periodicity – Properties of Discrete Time – Complex Exponential Unit Impulse – Unit Step Impulse Functions – Transformation in Independent Variable of Signals: Time Scaling – Time Shifting.Determination of Fourier Series Representation of Continuous Time and Discrete Time Periodic Signals – Properties of Continuous Time and Discrete Time Fourier Series.

UNIT II ANALYSIS OF CONTINUOUS TIME SIGNALS AND SYSTEMS 9

Continuous Time Fourier Transform and Laplace Transform Analysis with Examples – Properties, Parseval's Relation – and Convolution in Time and Frequency Domains – Basic Properties of Continuous Time Systems: Linearity – Causality – Time Invariance – Stability – Magnitude and Phase Representations of Frequency Response of LTI Systems – Analysis and Characterization of LTI Systems using Laplace Transform: Computation of Impulse Response and Transfer Function using Laplace Transform

UNIT III SAMPLING THEOREM AND Z - TRANSFORMS 9

Representation of Continuous Time Signals by its Sample – Sampling Theorem – Reconstruction of a Signal from its Samples – Aliasing – Discrete Time Processing of Continuous Time Signals – Sampling of Band Pass Signals. Basic Principles of Z-Transform – Definition – Region of Convergence – Properties of ROC – Properties of Z-Transform – Poles and Zeros – Inverse Z-Transform using Contour Integration – Residue Theorem – Power Series Expansion and Partial Fraction Expansion – Relationship between Z-Transform and Fourier Transform.

UNIT IV DISCRETE TIME SYSTEMS 9

Computation of Impulse Response and Transfer Function using Z-Transform. DTFT Properties and Examples – LTI – DT Systems – Characterization using Difference Equation – Block Diagram Representation – Properties of Convolution and the Interconnection of LTI Systems – Causality and Stability of LTI Systems.

UNIT V SYSTEMS WITH FINITE AND INFINITE DURATION IMPULSE RESPONSE 9

Systems with Finite Duration and Infinite Duration Impulse Response – Recursive and Non–Recursive Discrete Time System – Realization Structures – Direct Form – I-direct Form – II-Transpose – Cascade and Parallel Forms.

L: 45 T: 15 Total: 60

TEXT BOOK

1. AlanV.Oppenheim, Alan S.Willsky with S.Hamid Nawab, “Signals & Systems”, Second Edition, Pearson Education, 1997.

REFERENCES

1. John G.Proakis and Dimitris G.Manolakis, “Digital Signal Processing-Principles, Algorithms and Applications”, Third Edition, PHI, 2000.
2. M.J.Roberts, “Signals and Systems Analysis using Transform method and MATLAB”, TMH, 2003.
3. Simon Haykin and Barry Van Veen, “Signals and Systems”, John Wiley, 1999.
4. Moman H. Hays, “Digital Signal Processing”, Schaum’s outlines, Tata McGraw-Hill, 2004.
5. Ashok Amhardar, “Analog and Digital Signal Processing”, Second Edition, Thomson, 2002.

ELECTRONIC DEVICES AND CIRCUITS

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UNIT I ELECTRON BALLISTICS AND APPLICATIONS 9

Force on charged particles in an electric field – magnetic field – calculation of electrostatic and magnetic deflection sensitivity in cathode ray tube – analysis of parallel and perpendicular electric and magnetic fields – cyclotron – energy band structure of conductors – intrinsic and extrinsic semiconductor – N and P type – insulators – Hall effect.

UNIT II SEMICONDUCTOR DIODES 9

PN junction – derivation of diode equation – current components – switching characteristics of diode – common diode applications – characteristics and applications of Varactor diode and Zener diode – Mechanism of Avalanche and Zener breakdown – backward diode – tunnel diode – PIN diode – point contact diode – Schottky barrier diode – photo diode – APD – light emitting diodes.

UNIT III BIPOLAR JUNCTION TRANSISTORS AND FIELD EFFECT TRANSISTORS 9

Bipolar junction transistor – PNP and NPN action – current components – Eber-Moll model – transistor switching times – comparison of CE, CB and CC configuration – BJT applications – construction and characteristics of JFET – Relation between Pinch-off voltage and Drain current – MOSFET – enhancement and depletion types – MESFET – introduction to VMOS and CMOS devices.

UNIT IV TRANSISTOR BIASING 9

BJT – operating point – need for biasing – various biasing methods of BJT – bias stability – stability parameters – biasing methods of FET – use of JFET as a voltage variable resistor (VVR).

UNIT V POWER SUPPLY AND POWER AMPLIFIERS 9

Basic Elements of Regulated Power Supply System – Stabilization – Series and Shunt Voltage Regulators – General purpose and Monolithic Linear Regulators – Switching Regulators. Classification of Power Amplifiers (Class A, B, AB, C&D) – Efficiency of Class A – RC Coupled and Transformer – Coupled Power Amplifiers – Class B Complementary-Symmetry – Push-Pull Power Amplifiers.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Jacob Millman & Christos C.Halkias, “Electronic Devices and Circuits” Tata McGraw–Hill, 1991.
2. Robert T.Paynter, Introductory Electronic Devices and Circuits, Pearson Education, Seventh Edition**,** 2006.

REFERENCES

1. Boylestad ,R.L and Nashelsky,L,”Electronic Devices and Circuit Theory”, Pearson Education,1997
2. Donald A.Neaman,” Semiconductor Physics and Devices” Third Edition, Tata McGraw-Hill, 2002.
3. S.Salivahanan, N.Sureshkumar and A.Vallavaraj, “Electronic Devices and Circuits”, TMH, 1998.

DATA STRUCTURES

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UNIT I PROBLEM SOLVING **9**

Problem Solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample algorithms.

UNIT II LISTS - STACKS AND QUEUES **8**

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT.

UNIT III TREES **10**

Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple Implementations – Binary Heap

UNIT IV SORTING **9**

Insertion Sort – Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting.

UNIT V GRAPHS **9**

Topological Sort – Shortest Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP Completeness.

Total: 45

TEXT BOOKS

1. R. G. Dromey, "How to Solve it by Computer", Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, Second Edition, 2002.

REFERENCES

1. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education, 2004.
2. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures, A Pseudocode Approach with C", Thomson Brooks / COLE, 1998.
3. Aho J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
4. Harowitz, Sahani, Anderson-Freed, "Fundamentals of DataStructures in C", Second Edition, Universities Press, 2007.

OBJECT ORIENTED PROGRAMMING

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UNIT I FUNDAMENTALS 9

Object Oriented Programming Concepts – Encapsulation – Programming Elements – Program Structure – Enumeration Types — Functions and Pointers – Function Invocation – Overloading Functions – Scope and Storage Class – Pointer Types – Arrays and Pointers – Call-by-Reference – Assertions – Standard Template Library.

UNIT II IMPLEMENTING ADTS AND ENCAPSULATION 9

Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields – Data Handling and Member Functions – Classes – Constructors and Destructors – Static Member – this Pointer – Reference Semantics – Implementation of Simple ADTs.

UNIT III POLYMORPHISM 9

ADT Conversions – Overloading – Overloading Operators – Unary Operator Overloading – Binary Operator Overloading – Function Selection – Pointer Operators

UNIT IV INHERITANCE 9

Derived Class – Typing Conversions and Visibility – Code Reuse – Virtual Functions – Run-Time Type Identifications –Exceptions – Handlers – Standard Exceptions.

UNIT V TEMPLATES AND FILE HANDLING 9

Template Class – Function Templates – Class Templates – C++ Streams – Console Streams – Console Stream Classes – Formatted and Unformatted Console I/O Operations – Manipulators – File Streams – Classes File Modes – File Pointers and Manipulations – File I/O – Exception Handling

Total: 45

TEXT BOOKS

1. Ira Pohl, “Object–Oriented Programming Using C++”, Second Edition, Pearson Education, 2003
2. K.R.Venugopal, Rajkumar Buyya and T.Ravishankar, “Mastering C++”, TMH, 2003.

REFERENCES

1. Ashok N.Kamthane, “Object-Oriented Probramming with ANSI and Turbo C++”, Pearson Education, 2006.
2. Bjarne Stroustrup, “The C++ programming language”, Addison Wesley, 2000.
3. John R.Hubbard, “Progranning with C++”, Schaums outline series, TMH, 2003.

PRINCIPLES OF COMMUNICATION ENGINERRING

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UNIT I AMPLITUDE MODULATION 9

Principles of Amplitude Modulation – AM Envelope – Frequency Spectrum and Bandwidth – Modulation Index and Percent Modulation – AM Power Distribution – AM Modulator Circuits – Low Level AM Modulator – Medium Power AM Modulator – AM Transmitters – Low Level Transmitters – High Level Transmitters – Receiver Parameters – AM Reception AM Receivers – TRF – Super Heterodyne Receivers – Double Conversion AM Receivers.

UNIT II ANGLE MODULATION 9

Angle Modulation – FM and PM Waveforms – Phase Deviation and Modulation Index – Frequency Deviation – Phase and Frequency Modulators and Demodulators – Frequency Spectrum of Angle Modulated Waves – Bandwidth Requirement – Broadcast Band FM – Average Power FM and PM Modulators – Direct FM and PM – Direct FM Transmitters – Indirect Transmitters – Angle Modulation Vs. Amplitude Modulation – FM Receivers FM Demodulators – PLL FM Demodulators – FM Noise Suppression – Frequency Vs. Phase Modulation.

UNIT III DIGITAL MODULATION 9

Introduction – Binary PSK – DPSK – Differentially Encoded PSK – QPSK – M-ary PSK – QASK – Binary FSK – MSK – GMSK – Duobinary Encoding – Performance Comparison of Various Systems of Digital Modulation.

UNIT IV BASEBAND DATA TRANSMISSION 9

Sampling Theorem – Quadrature Sampling of Bandpass Signals – Reconstruction of Message from its Samples – Signal Distortion in Sampling – Discrete PAM Signals – Power Spectra of Discrete PAM Signals – ISI Nyquist Criterion for Distortionless Baseband Binary Transmission – Eye Pattern – Baseband M-ary PAM Systems – Adaptive Equalization for Data Transmission.

UNIT V SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES 9

Introduction – Pseudo-Noise Sequence – DS Spread Spectrum with Coherent Binary PSK – Processing Gain – FH Spread Spectrum – Multiple Access Techniques – Wireless Communications – TDMA and CDMA – Wireless Communication Systems – Source Coding of Speech for Wireless Communications.

L: 45 T: 15 Total: 60

TEXT BOOKS

1. Wayne Tomasi, “Electronic Communication Systems: Fundamentals Through Advanced”, Pearson Education, 2001.
2. Simon Haykin, “Digital Communications”, John Wiley & Sons, 2003.

REFERENCES

1. Simon Haykin, “Communication Systems”, Fourth Edition, John Wiley & Sons,2001.
2. Taub & Schilling, “Principles of Communication Systems”, Second Edition, TMH, 2003.
3. Martin S.Roden, “Analog and Digital Communication System”, Third Edition, PHI, 2002.
4. Blake, “Electronic Communication Systems”, Second Edition, Thomson Delman, 2002.

ELECTRONIC DEVICES AND CIRCUITS LABORATORY

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1. Measurement of characteristics of PN Junction Diode.
2. Measurement of characteristics of Zener Diode
3. Measurement of characteristics of Special Diodes such as
   a. Varactor Diode
   b. Tunnel Diode
   c. Photo Diode
   d. Schottky Diode
4. Clipper and Clamper Circuits using Diode.
5. Design and testing of Rectifiers with and without Filters.
6. Input and Output characteristics of BJT and determination of h- parameters from the graph.
7. Output characteristics of JFET.
   a.. Plot of Transfer characteristics from the output characteristics.
   b. Determination of pinch off voltage and Ids
8. Fixed Bias amplifier circuits using BJT.
9. BJT Amplifier using voltage divider bias (self bias) with unbypassed emitter resistor.
10. Source follower with Bootstrapped gate resistance.
11. Measurement of UJT and SCR Characteristics.
    a. Firing Characteristics of SCR.
    b. Measurement of Intrinsic stands off ratio of UJT.
    c. Measurement of DIAC and TRIAC Characteristics.
12. Measurement of Characteristics of Power Amplifiers (Class A, B and C)

Total: 45

DATA STRUCTURES LABORATORY

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Implement the following exercises using C

1. Array Implementation of List ADT
2. Linked List Implementation of List ADT
3. Cursor Implementation of List ADT
4. Array Implementation of Stack ADT
5. Linked List Implementation of Stack ADT
6. The following three exercises are to be done by implementing the following source files
   (a) Program for 'Balanced Paranthesis'
   (b) Array Implementation of Stack ADT
   (c) Linked List Implementation of Stack ADT
   (d) Program for 'Evaluating Postfix Expressions'

   An appropriate header file for the Stack ADT should be included in (a) and (d)
   I. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
   II. Implement the application for checking 'Balanced Paranthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 1 and implementing file (c))
   III. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b) - and then by using files (d) and (c))
7. Queue ADT
8. Search Tree ADT – Binary Search Tree
9. Heap Sort
10. Quick Sort

Total: 45

OBJECT ORIENTED PROGRAMMING LABORATORY

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1. Programs Using Functions
   - Functions with Default Arguments
   - Implementation of Call by Value - Call by Address

2. Simple Classes for Understanding Objects - Member Functions and Constructors
   - Classes with Primitive Data Members
   - Classes with Arrays as Data Members
   - Classes with Pointers as Data Members - String Class
   - Classes with Constant Data Members
   - Classes with Static Member Functions

3. Compile Time Polymorphism
   - Operator Overloading including Unary and Binary Operators.
   - Function Overloading

4. Runtime Polymorphism
   - Inheritance
   - Virtual Functions
   - Virtual Base Classes
   - Templates

5. File Handling
   - Sequential Access
   - Random Access

Total: 45

SEMESTER IV

PROBABILITY AND QUEUEING THEORY

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UNIT I PROBABILITY AND RANDOM VARIABLE 9

Axioms of Probability – Conditional Probability – Total Probability – Baye's Theorem – Random Variable – Probability Mass Function – Probability Density Function – Properties – Moments – Moment Generating Functions and their Properties.

UNIT II STANDARD DISTRIBUTIONS 9

Binomial – Poisson – Uniform – Exponential – Gamma – Normal Distributions and their Properties – Functions of a Random variable – Chebyshev inequality

UNIT III TWO DIMENSIONAL RANDOM VARIABLES 9

Joint Distributions – Marginal and Conditional Distributions – Covariance – Correlation and Regression – Transformation of Random Variables – Central Limit Theorem.

UNIT IV RANDOM PROCESSES AND MARKOV CHAINS 9

Classification – Stationary Process – Markov Process – Poisson Process – Birth and Death Process – Markov Chains – Transition Probabilities – Limiting Distributions.

UNIT V QUEUEING THEORY 9

Markovian Models – M/M/1 – M/M/C – Finite and Infinite Capacity – M/M/∞ Queues – Finite Source Model – M/G/1 Queue (Steady State Solutions Only) – Pollaczek – Khintchine Formula – Special Cases.

L: 45 T: 15 Total: 60

TEXT BOOKS

1. Ross S., "A first course in probability", Seventh Edition, Pearson Education, 2006.
2. S.Karlin and H.M. Taylor.,"An Introduction to Stochastic Modeling" Academic Press, 2007
3. Taha, H. A., "Operations Research - An Introduction", Eighth Edition, Pearson Education, 2007.

REFERENCES

1. Veerarajan T., "Probability, Statistics and Random Processes", Second Edition, Tata McGraw Hill, 2006.
2. Richard A Johnson, "Probability and Statistics for Engineers", Seventh Edition, Pearson Education, 2005.
3. Gross D. and Harris, C.M., "Fundamentals of Queuing Theory", Third Edition,John Wiley and Sons, 1998.

MICROPROCESSORS AND MICROCONTROLLERS

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UNIT I 8085 MICROPROCESSOR 9

Introduction to 8085 – Microprocessor Architecture – Instruction Set – Programming the 8085 – Code Conversion.

UNIT II 8086 SOFTWARE ASPECTS 9

Intel 8086 Microprocessor – Architecture – Instruction Set and Assembler Directives – Addressing Modes – Assembly Language Programming – Procedures – Macros – Interrupts and Interrupt Service Routines.

UNIT III 8086 SYSTEM DESIGN 9

8086 Signals and Timing – Min/Max Mode of Operation – Addressing Memory and I/O – Multiprocessor Configurations – System Design using 8086

UNIT IV I/O INTERFACING 9

Memory Interfacing and I/O Interfacing – Parallel Communication Interface – Serial Communication Interface – Timer – Keyboard /Display Controller – Interrupt Controller – DMA Controller – Programming and Applications.

UNIT V MICROCONTROLLERS 9

Architecture of 8051 – Signals – Operational Features – Memory and I/O Addressing – Interrupts – Instruction Set – Applications.

Total: 45

TEXT BOOKS

1. Ramesh S.Gaonkar, "Microprocessor**:** Architecture, Programming and Applications with the 8085", Fifth Edition, Penram International publishing private limited, 2002.
2. A.K. Ray and K.M.Bhurchandi, "Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing", TMH, 2002.

REFERENCES

1. Douglas V. Hall, "Microprocessors and Interfacing Programming and Hardware", Third Edition, TMH, 2002.
2. Yu -cheng Liu, Glenn A.Gibson, "Microcomputer systems The 8086 / 8088 Family architecture, Programming and Design", PHI, 2003.
3. Mohamed Ali Mazidi, and Janice Gillispie Mazidi, "The 8051 microcontroller and embedded systems", Pearson Education, 2004.

INFORMATION CODING TECHNIQUES

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UNIT I INFORMATION ENTROPY FUNDAMENTALS 9

Uncertainty – Information and Entropy – Source Coding Theorem – Huffman Coding –Shannon Fano Coding – Discrete Memory Less Channels – Channel Capacity – Channel Coding Theorem – Channel Capacity Theorem.

UNIT II DATA AND VOICE CODING 9

Differential Pulse Code Modulation – Adaptive Differential Pulse Code Modulation – Adaptive Sub–Band Coding – Delta Modulation – Adaptive Delta Modulation – Coding of Speech Signal at Low Bit Rates (Vocoders - Lpc).

UNIT III ERROR CONTROL CODING 9

Linear Block Codes – Syndrome Decoding – Minimum Distance Consideration – Cyclic Codes – Generator Polynomial – Parity Check Polynomial – Encoder for Cyclic Codes – Calculation of Syndrome – Convolutional Codes.

UNIT IV COMPRESSION TECHNIQUES 9

Principles – Text Compression – Static Huffman Coding – Dynamic Huffman Coding – Arithmetic Coding – Image Compression – Graphics Interchange Format – Tagged Image File Format – Digitized Documents – Introduction to Jpeg Standards.

UNIT V AUDIO AND VIDEO CODING 9

Linear Predictive Coding – Code Excited LPC – Perceptual Coding – MPEG Audio Coders – Dolby Audio Coders – Video Compression – Principles – Introduction To H.261 & MPEG Video Standards.

Total: 45

TEXTBOOKS

1. Simon Haykin, “Communication Systems”, Fourth Edition, John Wiley and Sons, 2001.
2. Fred Halsall, “Multimedia Communications - Applications Networks Protocols and Standards”, Pearson Education, 2002.

REFERENCES

1. Mark Nelson, “Data Compression Book”, BPB, 1992.
2. Watkinson J, “Compression in Video and Audio”, Focal Press, 1995.

COMPUTER ARCHITECTURE

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UNIT I BASIC STRUCTURE OF COMPUTERS 9

Functional Units – Basic Operational Concepts – Bus Structures – Software Performance – Memory Locations and Addresses – Memory Operations – Instruction and Instruction Sequencing – Addressing Modes – Assembly Language – Basic I/O Operations – Stacks and Queues.

UNIT II ARITHMETIC UNIT 9

Addition and Subtraction of Signed Numbers – Design of Fast Adders – Multiplication of Positive Numbers – Signed Operand Multiplication and Fast Multiplication – Integer Division – Floating Point Numbers and Operations.

UNIT III BASIC PROCESSING UNIT 9

Fundamental Concepts – Execution of a Complete Instruction – Multiple Bus Organization – Hardwired Control – Microprogrammed Control – Pipelining – Basic Concepts – Data Hazards – Instruction Hazards – Influence on Instruction Sets – Data Path and Control Consideration – Superscalar Operation – Performance Considerations.

UNIT IV I/O ORGANIZATION 9

Accessing I/O Devices – Interrupts – Direct Memory Access – Buses – Interface Circuits – Standard I/O Interfaces (PCI - SCSI - USB).

UNIT V MEMORY SYSTEM 9

Memory Concepts – Semiconductor RAMs – ROMs – Speed – Size and Cost – Cache Memories – Performance Consideration – Virtual Memory – Memory Management Requirements – Secondary Storage.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, “Computer Organization”, Fifth Edition, Mc Graw-Hill, 2002.

REFERENCES

1. William Stallings, “Computer Organization and Architecture**:** Designing for Performance”, Sixth Edition, Pearson Education, 2003.
2. David A Patterson and John L.Hennessy, “Computer Organization and Design The hardware / software interface”, Second Edition, Morgan Kaufmann, 2002.
3. John P Hayes, “Computer Architecture and Organization”, Third Edition, McGraw-Hill, 1998.

DIGITAL SIGNAL PROCESSING

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UNIT I SIGNALS AND SYSTEMS 9

Basic Elements of Digital Signal Processing – Concept of Frequency in Continuous Time and Discrete Time Signals – Sampling Theorem – Discrete Time Signals – Discrete Time Systems – Analysis of Linear Time Invariant Systems – Z Transform – Convolution and Correlation.

UNIT II FAST FOURIER TRANSFORMS 9

Introduction to DFT – Efficient Computation of DFT – Properties of DFT – FFT Algorithms – Radix-2 and Radix-4 FFT Algorithms – Decimation in Time – Decimation in Frequency Algorithms – Use of FFT Algorithms in Linear Filtering and Correlation.

UNIT III IIR FILTER DESIGN 9

Structure of IIR – System Design of Discrete Time IIR filter From Continuous Time Filter – IIR Filter Design by Impulse Invariance – Bilinear Transformation – Approximation Derivatives – Design of IIR Filter in the Frequency Domain.

UNIT IV FIR FILTER DESIGN 9

Symmetric & Antisymteric FIR Filters – Linear Phase Filter – Windowing Technique – Rectangular – Kaiser Windows – Frequency Sampling Techniques – Structure for FIR Systems.

UNIT V FINITE WORD LENGTH EFFECTS 9

Quantization Noise – Derivation for Quantization Noise Power – Fixed Point and Binary Floating Point Number Representation – Comparison – Over Flow Error – Truncation Error – Co-Efficient Quantization Error – Limit Cycle Oscillation – Signal Scaling – Analytical Model of Sample and Hold Operations – Application of DSP – Model of Speech Wave Form – Vocoder.

L: 45 T: 15 Total: 60

TEXT BOOK

1. John G Proakis and Dimtris G Manolakis, “Digital Signal Processing Principles - Algorithms and Application”, Third Edition, PHI/Pearson Education, 2000.

REFERENCES

1. Alan V Oppenheim, Ronald W Schafer and John R Buck, “Discrete Time Signal Processing”, Second Edition, PHI/Pearson Education, 2000.
2. Johny R.Johnson, “Introduction to Digital Signal Processing”, Prentice Hall of India/Pearson Education, 2002.
3. Sanjit K.Mitra, “Digital Signal Processing A Computer - Based Approach”, Second Edition, Tata McGraw-Hill, 2001.

DATABASE MANAGEMENT SYSTEMS

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UNIT I FUNDAMENTALS AND CONCEPTUAL MODELING 9

Introduction to File And Database Systems – Database System Structure – Data Models – Introduction to Network and Hierarchical Models – ER Model – Relational Model – Relational Algebra and Calculus.

UNIT II RELATIONAL MODEL 9

SQL – Data Definition – Queries in SQL – Updates – Views – Integrity and Security – Relational Database Design – Functional Dependences and Normalization for Relational Databases (Up To BCNF).

UNIT III DATA STORAGE AND QUERY PROCESSING 9

Record Storage and Primary File Organization – Secondary Storage Devices – Operations On Files – Heap File – Sorted Files – Hashing Techniques – Index Structure for Files – Different Types of Indexes – B-Tree – B+Tree – Query Processing.

UNIT IV TRANSACTION MANAGEMENT 9

Transaction Processing – Introduction – Need for Concurrency Control – Desirable Properties of Transaction – Schedule and Recoverability – Serializability and Schedules – Concurrency Control – Types of Locks – Two Phases Locking – Deadlock – Time Stamp Based Concurrency Control – Recovery Techniques – Concepts – Immediate Update – Deferred Update – Shadow Paging.

UNIT V CURRENT TRENDS 9

Object Oriented Databases – Need for Complex Data types – OO Data Model – Nested Relations – Complex Types – Inheritance Reference Types – Distributed Databases – Homogenous and Heterogenous – Distributed Data Storage – XML – Structure of XML – Data – XML Document – Schema – Querying and Transformation – Data Mining and Data Warehousing.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.

REFERENCES

1. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill, 2003.
3. Hector Garcia, Molina, Jeffrey D.Ullman and Jennifer Widom, “Database System Implementation”, Pearson Education, 2000.
4. Peter Rob and Corlos Coronel, “Database System, Design, Implementation and Management”, Fifth Edition, Thompson Learning Course Technology, 2003.

MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

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LIST OF EXPERIMENTS

1. Programming with 8085 - 8 - bit / 16 - bit multiplication/division using repeated addition/subtraction.
2. Programming with 8085 - code conversion - decimal arithmetic - bit manipulations.
3. Programming with 8085, matrix multiplication, floating point operations
4. Programming with 8086 - String manipulation, search, find and replace, copy operations, sorting. (PC Required)
5. Using BIOS/DOS calls Keyboard control, display, file manipulation. (PC Required)
6. Using BIOS/DOS calls Disk operations. (PC Required)
7. Interfacing with 8085/8086, 8255, 8253
8. Interfacing with 8085/8086, 8279, 8251
9. 8051 Microcontroller based experiments - Simple assembly language programs (cross assembler required).
10. 8051 Microcontroller based experiments - Simple control applications (cross assembler required).

Total: 45

DIGITAL SIGNAL PROCESSING LABORATORY

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LIST OF EXPERIMENTS

USING TMS320C5X

1. Study of various addressing modes of DSP using simple programming examples
2. Sampling of input signal and display
3. Implementation of FIR filter
4. Calculation of FFT

USING MATLAB

1. Generation of Signals
2. Linear and circular convolution of two sequences
3. Sampling and effect of aliasing
4. Design of FIR filters
5. Design of IIR filters
6. Calculation of FFT of a signal

Total: 45

DATABASE MANAGEMENT SYSTEMS LABORATORY

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LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-Level Language extension with Cursors.
4. High Level Language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database Design using E-R model and Normalization.
8. Design and Implementation of Payroll Processing System.
9. Design and Implementation of Banking System.
10. Design and Implementation of Library Information System.

Total: 45

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