

Semester-IV

Theory Courses

Course Code	Title	Scheme of Examination				Hrs./Week		
		Duration (hrs)	IA	UE	Total Marks	L	T	P
ITE-421	Mathematics-IV	3	40	60	100	3	1	0
ITE-422	Microprocessor & Interfacing	3	40	60	100	3	1	0
ITE-423	Analog Communication System	3	40	60	100	3	1	0
ITE-424	Data Base Management System	3	40	60	100	3	1	0
ITE-425	Design & Analysis of Algorithms	3	40	60	100	3	1	0
ITE-426	Principles of Marketing & Management	3	40	60	100	3	1	0
Total			240	360	600			

Laboratory Courses

ITE-431	Microprocessor & Interfacing	2	25	25	50	0	0	2
ITE-432	Analog Communication System	2	25	25	50	0	0	2
ITE-433	Data Base Management System	2	25	25	50	0	0	2
Total			75	75	150			
Total (Theory + Lab)			315	435	750			

Semester IV

Course Title: Mathematics-IV
Course Code: ITE-421
Duration of Exam: 3 hours

Max Marks: 100
University Exam: 60
Internal Assessment: 40

Objective: The course is designed to provide basic knowledge of theory of complex variables, Numerical analysis and Z-transform to engineering students.

Unit-I

Complex Analysis-I: Function of complex variable, Limit, Continuity and differentiability of functions of complex variable, Analytic function, Cauchy-Riemann equations, harmonic function, Construction of analytic functions by Milne-Thomson method, conformal mapping and bilinear transformations.

Unit-II

Complex Analysis-II: Complex integration, Line integral, Cauchy's integral formula, Derivatives of integral, Cauchy's inequality, Lowville's theorem, Taylor's and Laurent's series, Zeros and Singularities of complex functions, Residue and Cauchy's Residue theorem, Evaluation of real integrals by using Residue theorem.

Unit-III

Numerical Analysis-I: Finite-differences and operators, Finite and divided differences table, Differences of a polynomial, Factorial notation, Relation between operators, Newton's and Lagrange's interpolation formulae, Numerical differentiation and integration, Trapezoidal rule, Simpson's one-third rule, Simpson's third-eight rule.

Unit-IV

Numerical Analysis-II: Difference equations and their solutions. Solutions of algebraic and transcendental equations by iterative, Bisection, Regula-Falsi and Newton-Raphson methods, Numerical solution of ordinary differential equations by Picard's method, Euler's method, Modified Euler's method and Runge-Kutta method.

Unit-V

Z-Transform: Introduction and definition of z-transform, Some standard forms, Linearity property, Damping rule Some standard results, shifting un to the right and to the left, Multiplication by n. Two basic theorems, Inverse Z-Transform, Convolution theorem, Application to difference equations.

Text Books:

1. **Grewal B.S.**, Higher Engineering Mathematics

Reference Books:

1. **Santi Narayan**, Theory of Functions of Complex Variables
2. **Saxena H.C.**, Difference Calculus

Note for paper setter: The question paper shall comprise of 10 questions. Two questions will be set from each unit. The student has to attempt five questions selecting at least one question from each unit.

Semester IV

Course Title: Microprocessor & Interfacing
Course Code: ITE-422
Duration of Exam: 3 hours

Max Marks: 100
University Exam:60
Internal Assessment: 40

Objective: The objective of this course is to introduce to the students the fundamental of 8085 microprocessor and its interfacing.

Unit-I

Introduction To Microprocessor: History and Evolution, types of microprocessors, 8085 Microprocessor, Architecture, Bus Organization, Registers, ALU, Control section, Instruction set of 8085, Instruction format, Addressing modes, Types of Instructions.

Unit-II

Assembly Language Programming and Timing Diagram: Assembly language programming in 8085, Macros, Labels and Directives, Microprocessor timings, Instruction cycle, Machine cycles, T states, State transition diagrams, Timing diagram for different machine cycles.

Unit-III

Serial I/O, Interrupts and Comparison of Contemporary Microprocessors: Serial I/O using SID, SOD. Interrupts in 8085, RST instructions, Issues in implementing interrupts, Multiple interrupts and priorities, Interrupt handling in 8085 with RIM and SIM, Enabling, disabling and masking of interrupts. Brief comparison of contemporary 8-bit microprocessors like Z-80, M68000 with 8085.

Unit-IV

Data Transfer techniques: Data transfer techniques, Programmed data transfer, Parallel data transfer using 8155. Programmable parallel ports and handshake input/output, Asynchronous and Synchronous data transfer using 8251A. Programmable interrupt controller 8259A. DMA transfer, cycle stealing and burst mode of DMA, 8257 DMA controller.

Unit-V

Microprocessor Interfacing Techniques: Interfacing and refreshing dynamic RAMs, Interfacing a keyboard, Interfacing LED and seven segment displays, Interfacing A/D converters, D/A converters.

Text Books:

1. **R. S. Gaonkar**, μ processor Architecture, Programming & applications with the 8085/8086A, Wiley Eastern Ltd.
2. **Douglas V Hall**, Microprocessors & Interfacing.

Reference Books:

1. **A. P. Mathur**, Introduction to Microprocessor, Tata McGraw Hill.
2. **Yu-Cheng Liu & G A Gibson**, μ processor System, Arch Programming & Design.

Note for Paper Setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit .The student has to attempt five questions at least one from each unit.

Semester IV

Course Title: Analog Communication System

Course Code: ITE-423

Duration of Exam: 3 hours

Max Marks: 100

University Exam: 60

Internal Assessment: 40

Objective: The objective of this course is to introduce to the students the fundamental of analog communication.

Unit-I

Introduction to communication systems: Historical Review, Elements of an Electronic Communication System, Communication Channel and their Characteristics, channel capacity, Bandwidth, Signals and their classifications. Concept of time domain and frequency domain representation.

Unit-II

Modulation Techniques: Amplitude modulation, Frequency spectrum of AM Waves, Representations of AM waves, Power relation in AM waves, Need and description of SSB, suppression of carrier, suppression of unwanted side bands, vestigial side band system, frequency modulation (FM), Mathematical representation of FM, frequency spectrum & Band width of FM waves, Carson's rule, Wide band and narrow band FM, Phase modulation (PM), pulse code modulation (PCM).

Unit-III

AM Transmitters and Receivers: AM TRANSMITTERS: Generation of AM, low level and high level modulation, comparison of levels, AM transmitter block diagram, collector class C modulator, Base modulator, AM RECEIVERS: Tuned radio

frequency (TRF) receiver. Superheterodyne receiver, RF section and characteristics, mixers, frequency changing and tracking, IF rejection and IF amplifiers. Detection and automatic gain control (AGC), AM receiver characteristics.

Unit-IV

FM Transmitters and Receivers: Basic requirements and generation of FM, FM Modulation methods: Direct methods, variable capacitor modulator, varactor diode modulator, reactance modulators, disadvantages of direct method, indirect modulators, RC phase shift modulator, Armstrong FM systems. Limiters, single and double tuned demodulator, balanced slope detector, Foster Seeley or phase discriminator, block diagram of FM receiver, RF amplifiers, FM receiver characteristics.

Unit-V

Noise in Receivers: Source of noise, classification of noise - external noise, internal noise, Noise figure, signal to noise ratio (SNR), noise in AM & FM receivers, Preemphasis & De-emphasis in FM.

Text Book:

1. **Simon Haykin**, Communication Systems, John Wiley & sons, NY, 4th Edn, 2001.

Reference Books:

1. **Roddy and Coolen**, Electronic communication, PHI, New Delhi, 4th Edition, 2003.
2. **Taub and Schilling**, Principles of communication systems, TMH, New Delhi, 1995.
3. **Bruce Carlson et al**, Communication systems, McGraw-Hill Int., 4th Edition, 2002.

Note for Paper setter:-The Question paper shall comprise of 10 questions. Two questions will be set from each unit. The student has to attempt five questions at least one from each unit

Semester IV

Course Title: Database Management System
Course Code: ITE-424
Duration of Exam: 3 hours

Max Marks: 100
University Exam: 60
Internal Assessment: 40

Objective: To learn how databases work, and how to work with them.

Unit-I

Introduction: Drawbacks of Files Management System, Database System Concepts and Architecture, Data Abstraction, Schemas and Instances, Data Independence, Data Models, Database Language and Interface, DDL, DML, Overall Data Base Structure.

Data Modeling Using Entity Relationship Model: E.R. Model Concept, Notation for ER Diagrams, Mapping Constraints, Weak and Strong Entity Types, Keys, Concept of Super Key, Candidate Key, Primary Key, Extended ER Model, Specialization, Generalizations, Aggregation.

Unit-II

Relational Data Model and Language: Relational Data Model Concepts, Keys Constraints, Integrity Constraints, Domain Constraints, Referential Integrity, Assertions, Triggers, Relational Algebra, Relational Calculus, Domain and Tuple Calculus.

Unit-III

Introduction to SQL: SQL Data Type and Literals, Types of SQL Commands, SQL Operations (DDL, DML, and DCL), Tables, Views and Indexes, Queries and Nested Subqueries, Aggregate and Scalar Functions, Joins, Unions, Intersection, Minus, Triggers, Cursors, Procedures and Functions in SQL.

Unit-IV

Data Base Design and Normalization: Functional Dependencies, Armstrong's Axioms, Normalization: First, Second and Third Normal forms, BCNF, Multi-Valued Dependencies, Fourth Normal form, Join Dependencies and Fifth Normal form, DKNF, Decomposition, Dependency Preservation and Lossless Join.

Unit-V

Transaction & Concurrency Control: Transaction Concept, Transaction State, Schedules, Serializability of Schedules, Conflict & View Serializability, Testing of Serializability, Recoverability, Recovery From Transaction Failures, Log Based Recovery, Checkpoints, Shadow Paging, Recovery with Concurrent Transactions.

Concurrency Control Techniques: Concurrency Control, Lock Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity, Multi-Version Schemes, Deadlock Handling.

Text Books:

1. **Korth, Silbertz, Sudarshan**, Database Concepts, Tata McGraw Hill.
2. **Desai, Bipin C.** An Introduction to Database Systems, Galgotia Publications.

Reference Books:

1. **Elmasri & Navathe**, Fundamentals of Database Systems, Addison Wesley.
2. **Ramakrishna & Gehkre**, Database Management System, McGraw Hill.
3. **Date C. J.**, An Introduction to Database Systems, Addison Wesley.
4. **Madhulika Jain**, Introduction to Database Systems, BPB Publications.

Note for paper setter: The question paper shall comprise of 10 questions. Two questions will be set from each unit .The student has to attempt five questions at least one from each unit.

Semester IV

Course Title: Design & Analysis of Algorithms
Course Code: ITE-425
Duration of Exam: 3 hours

Max Marks: 100
University Exam: 60
Internal Assessment: 40

Objective: The objective of this course is to study paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.

Unit-I

Introduction to Algorithm: Areas of Study of Algorithms, Algorithm Design Paradigms, Concept of Algorithmic Efficiency, Run Time Analysis of Algorithms, Asymptotic Notations (O , Ω , Θ).

Divide and Conquer: Structure of Divide and Conquer Algorithms: Examples; Binary Search, Finding the Maximum and Minimum, Merge Sort, Quick Sort, Strassen's Matrix Multiplication; Analysis of Divide and Conquer Run Time Recurrence Relations.

Unit-II

Greedy Method: Overview of the Greedy Paradigm, Examples of Exact Optimization Solution (Minimum Cost Spanning Tree Using Prim's and Kruskal's Algorithms), Approximate Solution (Knapsack Problem), Single Source Shortest Paths.

Unit-III

Dynamic Programming: Overview, Difference between Dynamic Programming and Divide and Conquer, Applications: Shortest Path In Graph (Multistage Graph, All-Pairs Shortest Paths, Single-Source Shortest Paths: General Weights), Matrix Chain Multiplication, Traveling Salesman Problem, Longest Common Subsequence Problem.

Unit-IV

Graph Searching and Traversal: Overview, Binary Tree Traversal, Graph Traversal Methods (Depth First and Breadth First Search).

Back Tracking: Overview, 8-Queens Problem, 0/1 Knapsack Problem.

Unit-V

Brach And Bound: LC Searching, Bounding, FIFO Branch and Bound, LC Branch and Bound Application: 0/1 Knapsack Problem, Traveling Salesman Problem.

Basic Concepts of Complexity Classes. P, NP, Polynomial vs. Non-Polynomial Time Complexity, Reducibility, NP-Hard and NP-Complete Classes.

Text Books:

1. **Horowitz E., Sahni S., & Rajasekaran S.**, Fundamental of Computer Algorithms, Galgotia Publication
2. **Basse Sara, Gelder A. V.**, Computer Algorithms, Addison Wesley.

Reference Books:

1. **Cormen T. H., Leiserson, Rivest and Stein**, Introduction of Computer algorithm, PHI.

Note for paper setter: The question paper shall comprise of 10 questions. Two questions will be set from each unit. The student has to attempt five questions selecting at least one question from each unit.

Semester IV

Course Title: Principles of Marketing and Management **Max Marks: 100**
Course Code: ITE-426 **University Exam: 60**
Duration of Exam: 3 hours **Internal Assessment: 40**

Objective: To provide basic insights of principles of marketing and management.

Unit-I

Forms of Business Organizations: Sole Proprietorship, Partnership, Company- Public and Private Sector Enterprises. Principles of Management, Evolution of Management Function of a Manager.

Unit-II

Function of Management: Planning- Nature and purpose- Types of Plans- Objectives, Policies, Procedures, Rules, Strategies, Programmes, Projects.

Unit-III

Staffing: Selection-Recruitment Process, Decision Making Process- Types of Decisions Directing, Leadership, Motivation and Communication. Controlling- Processes, Techniques Budgetary and non- Budgetary.

Unit-IV

Financial Management: Short term and long term sources of Funds- Financing, decision, investment decision, investment decision, introduction to financial, Statements- Production Management- Planning and scheduling, purchasing inventory control.

Unit-V

Marketing Management: Introduction to marketing Mix, Product, Pricing, Promotion and Place. Personnel management, performance appraisal. Conflict-

Identification and Resolution Training and development. Introduction to total quality Management, quality circles.

Text Books:

1. **Koontz, H & Weihrich, H.** Management: A Global Perspective 10th ed.

Reference Books:

1. **Robbins, S. P,** Organizational Behaviour.
2. **Prasad, L. M,** Principles of management.

Note for paper setter: The Question paper shall comprise of 10 questions. Two questions will be set from each unit .The student has to attempt five questions at least one from each unit.

Semester IV

Course Title: Microprocessor & Interfacing
Course Code: ITE-431
Duration of Exam: 3 hours

Max Marks: 50
University Exam: 25
Internal Assessment: 25

List of Experiments:

1. Introduction to Microprocessor Kits and overview of Programming
2. Programs using basic programming construct
3. Program which used various control statements
4. Programs for interfacing
5. Programs on Timing and Delays
6. Interfacing of A/D Module
7. Interfacing of a stepper motor module

Note: This is only the suggested list of practical. Instructor may add or change some practical relevant to the course contents

Semester IV

Course Title: Analog Communication System
Course Code: ITE-432
Duration of Exam: 3 hours

Max Marks: 50
University Examination: 25
Internal Assessment: 25

List of Practical:

1. To study and calculate the modulation index of AM wave
2. To study the demodulation of AM wave and find out modulation frequency
3. To study and observe frequency modulation
4. Study of DSB-TC and SSB AM modulation and demodulation
5. Study of PAM, PPM & PWM modulation & demodulation
6. Study of voice communication using various types of modulation techniques
7. Study of signal Sampling and reconstruction techniques
8. Study of Nyquist criteria and aliasing
9. Comparison of frequency response of 2nd order and 4th order Butterworth low pass filter.
10. Study of AM/FM Transmitter and Receiver

Note: These are only the suggested list of practical. Instructor may add or change some practical relevant to the course contents

Semester IV

Course Title: Database Management System
Course Code: ITE-433
Duration of Exam: 3 hours

Max Marks: 50
University Exam:25
Internal Assessment: 25

List of Experiments

1. Login and logout of the SQL.
2. Creation of users and roles.
3. Database schema creation.
4. Database schema modification.
5. Dropping of Database schema.
6. Use of Insert command, Update, Delete, Select commands.
7. Use of various aggregate functions.
8. Making reports with SQL report writer.
9. Creation of PL/SQL stored procedures.
10. Creation of Database triggers.
11. Creation of Cursors.
12. One case study on Database Application Development.

Note: These are only the suggested list of experiments. Instructor may add or change some experiments relevant to the course contents