

III SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1.	1599301	Electrical & Electronics Engineering	PN	3	1	0	30	70	3
2.	1505302	Advanced Data Structures	PJ	3	1	0	30	70	3
3.	1505303	Digital Logic Design	PJ	3	1	0	30	70	3
4.	1505304	Discrete Mathematics	PJ	3	1	0	30	70	3
5.	1525305	Managerial Economics & Financial Analysis	PN	3	1	0	30	70	3
6.	1505306	Object Oriented Programming through C++	PJ	3	1	0	30	70	3
7.	1505307	Object Oriented Programming & Data Structures Lab	PJ	0	0	3	50	50	2
8.	1599308	Electrical & Electronics Engineering Lab	PN	0	0	3	50	50	2
		Total:		18	6	6	280	520	22

III Sem

(1599301) ELECTRICAL AND ELECTRONICS ENGINEERING

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Course Objectives:

- To understand electronic devices, including diodes, bipolar junction transistors and FET
- To study various Op-Amp applications

PART-A: ELECTRICAL ENGINEERING

UNIT I

Electrical Circuits: Basic concepts, Classification of elements, Kirchhoff's Laws, R-L-C Series, Parallel Circuits and Star – delta transformations.

UNIT II

DC Machines: Principle & Construction of DC Generator – EMF equation – Types. Principle of Operation of DC motor- Types – Torque Equation – Losses and Efficiency, Swinburne's Test and Load Test on D.C. Shunt Motor.

Transformers: Principle & Construction of single phase transformer –Types- EMF Equation- Equivalent circuit– Losses, Efficiency and Regulation (Definitions Only). OC and SC tests.

UNIT: III

AC Machines: Principle & Construction of Three Phase Induction Motor –Types, Slip – Torque Characteristics – Applications. Principle & Construction of Alternator –EMF equation- Regulation by synchronous impedance method.

TEXT BOOKS:

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiyah, TMH Publication.
2. Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition.
3. Principles of Electrical and Electronics Engineering by V. K. Mehta, S. Chand & Co.

REFERENCE BOOKS:

1. Fundamentals of Electrical and Electronics Engineering by T. Thyagarajan, 5th Edition SCITECH Publications, 2007.

2. Fundamentals of Electrical Engineering and Technology by William D. Stanley, John R. Hackworth, Richard L Jones – Thomson Learning.

PART-B: ELECTRONICS ENGINEERING

UNIT-IV

Diode and its Characteristics: PN Junction diode, Symbol, V-I characteristics, Diode Applications, Rectifiers-Half Wave, Full Wave and Bridge Rectifiers (Simple Problems).

UNIT-V

Transistors: PNP and NPN Junction Transistor, Transistor as an Amplifier, Single Stage CE Amplifier, Frequency Response of CE Amplifier, Concepts of Feedback Amplifier, Necessary conditions for Oscillators, SCR Characteristics and Applications.

UNIT-V

Operational Amplifier: Ideal op-amp characteristics, Block diagram of Commercial IC Op-Amp, inverting and non-inverting modes of operation, voltage follower, summer, Subtractor.

TEXT BOOKS:

1. R.L.Boylestad and Louis Nashelsky, "Electronic devices and circuits", 9th Edition, 2006, PEI/PHI.
2. G.K.Mittal, "Industrial Electronics".
3. Albert D.Helfrick, Willam D.Cooper, "Modern Electronic Instrumentation and Measurement Techniques".PHI.
4. Morris Mano, "Digital Design", PHI.

REFERENCE BOOKS

1. Jacob Millman and C. Halkias, "Electronic devices and circuits", McGraw Hill.
K. Lal Kishore, "Electronic Devices and Circuits", BSP. 2nd Edition, 2005

III Sem

(1505302) ADVANCED DATA STRUCTURES

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Course Objectives:

- To develop skills to design and analyze linear and non linear data structures
- To develop algorithms for manipulating linked lists, stacks, queues, trees and graphs
- To develop recursive algorithms as they apply to trees and graphs.

UNIT-I

Overview of Data Structures, Stacks: Definition, ADT, Array & Linked representations, Operations & Applications, Queues: Definition, ADT, Array & Linked representations, Operations, Circular Queues, Dequeues.

UNIT-II

Trees: Basic terminology, **Binary Trees:** Definition, Properties, Representation, ADT, Complete Binary Tree, Full Binary Tree, **Tree Traversal Algorithm:** Inorder, Preorder and Postorder.

Priority Queues: Definition, ADT, Heaps – Introduction, Min-heap and Max-heap, Operations on heap, Heap sort.

UNIT-III

Binary Search Trees (BST): Definitions, ADT, Operations and Implementations, BST with Duplicates, Indexed BST, Balanced Search Trees: AVL, Red-Black & Splay Trees, **Graphs:** Terminology, Representations, **Graph Traversal:** Depth First Search (DFS) & Breadth First Search (BFS), Minimum Spanning Trees.

UNIT-IV

Directories, Linear List Representations, Skip List Representation, **Hashing:** Introduction, Hash Table, Hash Functions, **Collisions:** Introduction, Separate Chaining, Open Addressing.

UNIT-V

Multiway Search Trees and B-Trees: m-Way search Trees and its operations, B-Trees, Operations on B-Trees, B+-Trees.

TEXT BOOKS:

1. Data Structures and Algorithms in C++, S.Sahni, University Press (India) Private Limited, Second Edition.
2. An Introduction to Data Structures with applications, Jean Paul Trembley and Paul G.Sorenson, McGraw Hill.
3. Data Structures using C++, Varsha H.Patil, Oxford University Press.

REFERENCE BOOKS:

1. Data Structures, Algorithms and Applications in C++, Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education.
2. Data Structures, Seymour Lipschutz, Schaum's Outlines, McGraw Hill.
3. Data Structures and Algorithms, G.A.V.Pai, Tata McGraw Hill.
4. Data Structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
5. Data Structures and algorithms in C++, Mark Allen Weiss, Pearson Education Limited, Second Edition.

III Sem

(1505303) DIGITAL LOGIC DESIGN

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Course Objectives:

- Acquire the skills to manipulate and examine Boolean algebraic expressions,
- To understand the fundamental principles of digital design
- To acquaint with classical hardware design for both combinational and sequential logic circuits.

UNIT I

BINARY SYSTEMS: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Binary codes, Binary Storage and Registers.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, Digital logic Gates, integrated circuits.

UNIT II

OPTIMIZED IMPLEMENTATION OF LOGIC FUNCTION: The Karnaugh map method, minimization of Product of Sum forms, incompletely specified functions, Multi level NAND and NOR circuits, Exclusive – Or and Equivalence functions ,A tabular method for minimization.

UNIT III

COMBINATIONAL LOGIC: Combinational Circuits, Design procedure, Code converters, Binary parallel adder, Decimal Adder, Binary multiplier, Magnitude comparator, Decoders, demultiplexers, Encoders, Multiplexers, Read Only Memory (ROM), PLA.

UNIT IV

SYNCHRONOUS SEQUENTIAL LOGIC: Sequential circuits, latches, Flip-Flops, Analysis of clocked sequential circuits, State Reduction and Assignment, Design Procedure.

UNIT V

REGISTERS AND COUNTERS: Registers, shift Registers, Ripple counters synchronous counters, Johnson counter

ASYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Analysis of asynchronous sequential circuits, Synthesis of asynchronous sequential circuits, State Reduction , Hazards.

TEXT BOOKS:

1. Digital Design – Third edition, M.Morris Mano, Pearson Education/PHI.
2. Fundamentals of digital logic design with VHDL By Stephen Brown and I Zvonko Vranesic, second edition, The McGraw-Hill.
3. Fundamentals of logic design, Roth, 5th edition, Thomson.

REFERENCES:

1. Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.
2. Switching and Logic Design, C.V.S. Rao, Pearson Education
3. Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, Edition.
4. Fundamentals of Digital Logic & Micro Computer Design, 5TH Edition, M. Rafiquzzaman
John Wiley

(1505304) DISCRETE MATHEMATICS

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Course Objectives:

- To make the students learn logical thinking and be able to apply enumerating techniques.
- To develop an understanding of functions and relations.
- To enable the students understand graph theoretic techniques.

UNIT-I

Mathematical Logic: Introduction, Statements and notations, Connectives: Negation, Conjunction, Disjunction, Statement Formulas and Truth Tables, Conditional and Biconditional, Well formed formulas, Tautologies, Equivalence of Formulas, Tautological Implications.

Normal Forms: Disjunctive Normal Forms, Conjunctive Normal Forms, Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms, Ordering and Uniqueness of Normal Forms.

UNIT-II

Relations and Ordering: Relations, Properties of Binary Relations in a Set, Equivalence Relations, Compatibility Relations, Composition of Binary Relations, Partial Ordering, Partially Ordered Set: Representation and Associated Terminology.

Functions: Definition and Introduction, Composition of Function, Inverse Functions.

Recursion: Recursive Function, Sets, and Predicates.

Lattices as Partially Ordered Sets: Definition and Examples, Some Properties of Lattices.

UNIT-III

Algebraic Structures: Algebraic Systems: Examples and General Properties – Definition and Examples, Some Simple Algebraic Systems and General Properties.

Semi Groups and Monoids: Definition and Examples, Homomorphism of Semi groups and Monoids, Subsemigroups and Submonoids.

Groups: Definitions and Examples, Subgroups and Homomorphisms, Cosets and Lagrange's Theorem.

UNIT-IV

Elementary Combinatorics: Basis of counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations & Permutations, with repetitions, Enumerating Permutations with Constrained repetitions, Binomial Coefficients, The Binomial and Multinomial theorems, the principles of Inclusion – Exclusion.

UNIT-V

Graphs: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers, The Four-Colour Problem.

TEXT BOOKS:

1. Discrete mathematical structures with applications to computer science - J P Tremblay and Manohar Mc Graw Hill
2. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e, J.L.Mott, A. Kandel, T.P. Baker, PHI

REFERENCE BOOKS:

1. Elements of Discrete Mathematics- A Computer Oriented Approach, C.L.Liu, D.P. Mohapatra, 3/e, TMH.
2. Discrete and Combinatorial Mathematics- An Applied Introduction, Ralph. P.Grimaldi, 5/e, Pearson Education.
3. Discrete Mathematics and its applications, 6th edition, K.H.Rosen, TMH.
4. Discrete Mathematical Structures, Mallik and Sen, Cengage Learning.
5. Discrete Mathematical Structures, Bernard Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.
6. Discrete Mathematics with Applications, Thomas Koshy, Elsevier.
7. Discrete Mathematics, Lovasz, Springer.

III SEM

(1525305) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

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Course Objectives:

1. To equip the budding engineering student with an understanding of concepts and tools of economic analysis.
2. Provide knowledge of managerial economics through differential economics concepts, accounting concepts are necessary to analyze and solve complex problems relating financial related matters in big industries.
3. An understanding of professional and ethical responsibility and ability to communicate effectively.
4. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
5. Recognition of the need for, and an ability to engage in life-long learning and to meet contemporary issues.

UNIT I

MANAGERIAL ECONOMICS AND DEMAND ANALYSIS:

Definition, Nature and Scope of Managerial Economics- relation with other disciplines. Demand analysis – Determinants, Law of Demand and its exceptions – Elasticity of Demand – Types and Measurement of Elasticity of Demand – Methods of Demand Forecasting.

UNIT II

THEORY OF PRODUCTION AND COST ANALYSIS:

Production Function – Isoquants and Isocost, MRTS, least cost combination of inputs, Cobb-Douglas production function, laws of returns, internal and external economies of scale.

Cost Analysis: Cost concepts and classification. Break-Even Analysis (BEA), determination of Break Even Point – Managerial significance and limitation of BEA.

UNIT III

INTRODUCTION TO MARKET AND PRICING POLICIES:

Markets Structures: Types of competition, features of perfect competition, Monopoly, Monopolistic competition. Price- Output determination under perfect competition and monopoly – Methods of pricing – cost plus pricing, marginal cost, limit pricing, skimming pricing, bundling pricing, sealed bid pricing and peak load pricing.

UNIT – IV

BUSINESS ORGINATIONS AND CAPITAL BUDGETING:

Characteristic features of business, features of Sole Proprietorship, Partnership, Joint Stock Company and Public Enterprises. Changing business environment in post- liberalization scenario.

Capital: Significance, Types, Method and Sources and raising finance – Capital Budgeting Methods – Pay back Method, Accounting Rate of return (ARR) and Net Present Value Method (simple problems).

UNIT – V

FINANCIAL ACCOUNTING AND ANALYSIS:

Double Entry Book keeping, Journal, Ledger, Trail Balance – Final Accounts (Trading, Profit and loss Account and Balance sheet with simple adjustments) – Analysis and interpretation of financial statements through Liquidity, Profitability and Capital structure Ratios.

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, 4/e, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, sultan chand, 2009.

REFERENCE BOOKS:

1. Premchand babu, Madan Mohan : Financial Accounting and Analysis, Himalaya,2009
2. Joseph G. Nellis and David parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
3. M.Sugunatha Reddy: Managerial Economics and Financial Analysis, Research India Publication, New Delhi, 2013.

III Sem

(1505306) OBJECT ORIENTED PROGRAMMING THROUGH C++

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Course Objectives:

- To make the students understand the features of object-oriented design and familiarize them with virtual functions, templates and exception handling.
- To enable the students solve various engineering problems in C++ programming language.

UNIT I

Principles of Object-Oriented Programming: Object-Oriented Programming Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOP, Applications of OOP.

Beginning with C++: Comments, Output Operator, The iostream File, Variables, Input Operator, Cascading of I/O Operators, Structure of C++ program.

UNIT II

Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers and Constants, Basic Data Types, Declaration of variables, Dynamic initialization of variables, Reference variables, Operators in C++, Scope resolution operator, Memory management operators, Manipulators, Control Structures,

Functions in C++: Function Prototyping, Call by reference, Return by reference, Inline Functions, Function Overloading.

UNIT III

Classes and Objects: Specifying a Class, Defining Member Functions, Memory allocation for objects, Static data members, Static member functions, Arrays of objects, Friendly functions,

Constructors and Destructors: Constructors, Parameterized constructors, Multiple constructors in a class, Constructors with default arguments, Copy constructor, Dynamic constructor, Destructors.

UNIT IV

Operator Overloading: Defining operator overloading, Overloading Unary operators, Overloading Binary operators, Overloading Binary operators using Friends.

Inheritance: Introduction, Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual base classes, Abstract classes.

UNIT V

Pointers, Virtual Functions and Polymorphism: this Pointer, Virtual Functions, Pure virtual functions.

Managing Console I/O Operations: Unformatted I/O operations, Formatted console I/O operations.

Templates: Class Templates, Function Templates, Overloading Template functions, Member function Templates.

Exception Handling: Basics of Exception handling, Exception handling mechanism.

TEXT BOOK:

1. The Complete Reference C++, Herbert Schildt, TMH 4th Edition.
2. Object Oriented Programming With C++, E. Balagurusamy, TMH 6th edition.
- 3.

REFERENCE BOOKS:

1. Object oriented programming with ANSI and TURBO C++, Ashok N Kamathane, Pearson education.
2. Object oriented programming with C++, Saurav Sahay, Oxford.
3. Learning C++ Programming :From Problem Analysis To Program Design, Malik, Thomson
4. Learning - Computer Science :A Structured Approach Using C++,2nd Ed., Forouzan, Thomson