JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II Year B.Tech. CSE - I Sem	L	T/P/D	C
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(53014) PROBABILITY AND STATISTICS

UNIT-I : Probability

Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem, Random variables – Discrete and continuous.

UNIT-II: Distributions

Binomial , Poisson & normal distributions related properties . Sampling distributions –Sampling distribution of means (σ known and Unknown)

UNIT-III: Testing of Hypothesis I

Tests of hypothesis point estimations – interval estimations Bayesian estimation. Large samples, Null hypothesis – Alternate hypothesis type I, & type II errors – critical region confidential interval for mean testing of single variance. Difference between the mean.

UNIT-IV : Testing of Hypothesis II

Confidential interval for the proportions. Tests of hypothesis for the proportions single and difference between the proportions.

UNIT-V: Small samples

Confidence interval for the t- distribution – Tests of hypothesis – t-distributions, F- distributions χ^2 distribution. Test of Hypothesis –.

UNIT-VI

Correlation & Regression

Coefficient of correlation – Regression Coefficient – The lines of regression – The rank correlation

UNIT-VII

Queuing Theory

Arrival Theorem - Pure Birth process and Death Process M/M/1 Model .

UNIT-VIII

Stochastic processes

Introduction to Stochastic Processes – Markov process classification of states – Examples of Markov Chains, Stochastic Matrix, limiting probabilities.

TEXT BOOKS:

1. Probability & Statistics by D.K. Murugesan & P.Guru Swamy, Anuradha Publications.
2. Probability & Statistics for Engineers by G.S.S.Bhisma Rao, Scitech Publications.

REFERENCES:

1. Probability & Statistics by T.K.V.Iyengar & B.Krishna Gandhi & Others, S.Chand.
2. Probability & Statistics by William Mendenhall & Others, Cengage Publications.
3. Higher Engineering Mathematics by B.S. Grewal, Khanna Publications.
4. Higher Engineering Mathematics by Jain & S.K.R. Iyengar, Narasa Publications.
5. A first course in Probability & Statistics by B.L.S. Prakasa Rao, World Scientific.
6. Probability & Statistics for Engineers, Miller and John E. Freund, Prentice Hall of India.

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(53022) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

UNIT-I

Mathematical Logic : Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers

UNIT-II

Predicates : Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-III

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties,

UNIT-IV

Algebraic structures : Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT-V

Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application

UNIT-VI

Recurrence Relation : Generating Functions, Function of Sequences

Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT-VII

Graph Theory : Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs

UNIT-VIII

Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS :

1. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.

REFERENCES :

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
3. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.
4. Discrete Mathematics with Applications, Thomas Koshy, Elsevier
5. Logic and Discrete Mathematics, Grass Man & Trembley, Pearson Education.

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(53023) DATA STRUCTURES THROUGH C++

Unit I :

C++ Class Overview- Basic OOP concepts,Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

Unit II :

Function Overloading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

Unit III :

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT,array and linked Implementations using template classes in C++. Trees – Basic Terminology, Binary tree ADT,array and linked representations,traversals,threaded binary trees.

Unit IV :

Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, Hashing-hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

Unit V :

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, Heap sort,External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

Unit VI :

Search Trees (Part1): Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL

Trees, Definition, Operations – Insertion and Searching

Unit VII :

Search trees (part- II): B-Trees,Definition, B-Tree of order m, insertion, deletion and searching, Comparison of Search Trees Graphs – Basic terminology, representations of Graphs,Graph search methods – DFS,BFS.

Unit VIII :

Text Processing - Pattern matching algorithms-Brute force, the Knuth-Morris-Pratt algorithm,Tries- Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS :

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press.
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley student edition,seventh edition, John Wiley and Sons.

REFERENCES :

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Cengage Learning.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
5. Data Structures using C++, D.S. Malik, Cengage Learning, India Edition.
6. Data structures with C++ Using STL, 2nd edition,W.H.Ford and W.R.Topp,Pearson/PHI
7. Mastering Algorithms with C,K.Loudon,O'Reilly,SPD pvt. Ltd.
8. An Introduction to Data structures and Algorithms,J.A.Storer,Springer.
9. Advanced Data structures & Algorithms in C++,V.V.Muniswamy,Jaico Publishing House.

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II Year B.Tech. CSE - I Sem L T/P/D C
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(53024) DIGITAL LOGIC DESIGN

UNIT-I

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

UNIT-II

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 gages, integrated circuits.

UNIT-III

GATE – LEVEL MINIMIZATION : The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementnations, Exclusive – Or function, Hardward Description language (HDL).

UNIT - IV

COMBINATIONAL LOGIC : Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

UNIT - V

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

UNIT - VI

Registers, shift Registers, Ripple counters synchronous counters, other counters, HDL for Registers and counters.

UNIT - VII

Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices.

UNIT-VIII

ASYNCHRONOUS SEQUENTIAL LOGIC : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduciton of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

TEXT BOOKS :

1. DIGITAL DESIGN – Third Edition , M.Morris Mano, Pearson Education/PHI.
2. 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

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II Year B.Tech. CSE - I Sem

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(53009) ELECTRONIC DEVICES AND CIRCUITS

Unit- I: p-n Junction Diode

Qualitative Theory of p-n Junction, p-n Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semi Conductor Diodes, Zener Diode Characteristics.

Unit- II: Rectifiers and Filters

The p-n junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L - Section Filters, β- Section Filters, Comparision of Filters, Voltage Regulation using Zener Diode.

Unit- III: Bipolar Junction Transistor

The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation , BJT Specifications.

Unit- IV: Transistor Biasing and Stabilization

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE} and â, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability.

Unit- V: Small Signal Low Frequency BJT Models

BJT Hybrid Model, Determination of h-parameters from Transistor Characteristics, Analysis of a Transistor Amplifier Circuit using h-Parameters, Comparison of CB, CE, and CC Amplifier Configurations.

Unit-VI: Field Effect Transistor

The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

Unit VII: FET Amplifiers

FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, Biasing FET, FET as Voltage Variable Resistor, Comparison of BJT and FET, The Uni Junction Transistor.

Unit VIII: Special Purpose Electronic Devices

Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram) and Varactor Diode. Principle of Operation of Schottky Barrier Diode, SCR, and Semiconductor Photo Diode.

TEXT BOOKS

1. Millman's Electronic Devices and Circuits – J. Millman, C.C.Halkias, and Satyabrata Jit, 2ed., 1998, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 ed., 2006, PEI/PHI.
3. Introduction to Electronic Devices and Circuits - Rober T. Paynter, PE.

REFERENCES

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 ed., 2008, TMH.
2. Electronic Devices and Circuits - K. Lal Kishore, 2 ed., 2005, BSP.
3. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1 ed., 2009, Wiley India Pvt. Ltd.
4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 ed., 2008, TMH.

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II Year B.Tech. CSE - I Sem	L	T/P/D	C
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(53025) BASIC ELECTRICAL ENGINEERING

UNIT - I

Introduction to Electrical Engineering : ohm's law, basic circuit components, Kirchhoff's laws. Simple problems.

UNIT-II

Network Analysis: Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, series parallel circuits, star delta and delta star transformation. , Network theorems- Superposition , Thevenins's, Maximum power transfer theorems and simple problems.

UNIT-III

Alternating Quantities: Principle of ac voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits.

UNIT-IV

Transformers : Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems).

UNIT-VI

D.C Generators: Principle of operation of dc machines, types of D.C generators, e.m.f eqation in D.C generator.

UNIT-V

D.C motors: Principle of operation of dc motors, types of D.C motors, losses and torque equation, losses and efficiency calculation in D.C generator

UNIT-VII

A.C Machines: Three phase induction motor, principle of operation, slip and rotor frequency, torque (simple problems.

UNIT VIII

Basic Instruments: Introduction, classification of instruments, operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron of Ammeters And Voltmeters (elementary Treatment only)

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.
3. Electrical and Electronic Technology-By Hughes – Pearson Education.

REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson.

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(53608) ELECTRICAL AND ELECTRONICS LAB

PART - A

1. Verification of Superposition and Reciprocity theorems.
2. Verification of maximum power transfer theorem. Verification on DC with Resistive load.
3. Experimental determination of Thevenin's theorem.
4. Magnetization characteristics of D.C. Shunt generator.
5. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
6. Brake test on DC shunt motor. Determination of performance Characteristics.
7. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors).
8. Brake test on 3-phase Induction motor (performance characteristics).

PART - B

1. PN Junction Diode Characteristics (Forward bias, Reverse bias)
2. Zener Diode Characteristics
3. Transistor CE Characteristics (Input and Output)
4. Rectifier without Filters (Full wave & Half wave)
5. Rectifier with Filters (Full wave & half wave)

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(53609) DATA STRUCTURES LAB THROUGH C++

Objectives:

- To make the student learn an object oriented way of solving problems.
- To make the student write ADTS for all data structures.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- C++ compiler and STL Recommended

Week1 :

Write C++ programs to implement the following using an array.

a) Stack ADT b) Queue ADT

Week2 :

Write C++ programs to implement the following using a singly linked list.

a) Stack ADT b) Queue ADT

Week3 :

Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

Week 4 :

Write a C++ program to perform the following operations:

a) Insert an element into a binary search tree.
b) Delete an element from a binary search tree.
c) Search for a key element in a binary search tree.

Week5 :

Write C++ programs that use recursive functions to traverse the given binary tree in

a) Preorder b) inorder and c) postorder.

Week6 :

Write C++ programs that use non-recursive functions to traverse the given binary tree in

b) Preorder b) inorder and c) postorder.

Week7 :

Write C++ programs for the implementation of bfs and dfs for a given graph.

Week8 :

Write C++ programs for implementing the following sorting methods:

a) Merge sort b) Heap sort

Week9 :

Write a C++ program to perform the following operations

a) Insertion into a B-tree b) Deletion from a B-tree

Week10 :

.Write a C++ program to perform the following operation

a) Insertion into an AVL-tree

Week11 :

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

Week12 :

Write a C++ program for implementing Knuth-Morris- Pratt pattern matching algorithm.

(Note: Use Class Templates in the above Programs)

TEXT BOOKS :

1. Data Structures A Pseudocode Approach with C++, India Edition, R.F.Gilberg and B.A.Forouzan,Cengage Learning.
2. Programming Principles and Practice using C++, B.Stroustrup,Addison-Wesley(Pearson education).
3. Data Structures and STL, W.J.Collins,Mc Graw Hill,International edition.
4. Data structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley& sons.
5. The Art,Philosophy, and Science of OOP with C++,Rick Miller,SPD.
6. C++ for Programmers,P.J.Deitel and H.M.Deitel,PHI/Pearson.