Applied Mathematics

Applied Mathematics(BSC-CS301)

Credits:- 4

1. Correlation, Regression & CurveFitting:
Introduction, Karl Pearson’s Coefficient of Correlation.,Lines of regression of bivariate data., Fitting of Curves by method of Least-squares, Fitting of Straight lines. Fitting of exponential curves. Fitting of second degree Parabolic curves.

2. Probability Distribution:
Random variables,Discrete Probability distribution, Continuous probability distribution,Binomial Distribution,Poisson Distribution,Normal Distribution.

3. Numerical Integration:
Newton Cotes formulae.Trapezoidal Rule,Simpson's 1/3rd rule.Simpson's 3/8th 06 rule, Weddle's Rule.

4. Introduction to Fuzzysets:
Crisp set and Fuzzy set, Basic concepts of fuzzy sets, Basic operations on fuzzy sets,Properties of fuzzy sets

5. Fuzzy Arithmetic: Fuzzy numbers,Fuzzy cardinality, Arithmetic Operations on Fuzzy numbers,Solutions of Fuzzy equations of type A + X = B&A.X

6. Assignment Problem: Definition, Balanced and Unbalanced assignment problem, Hungarian Method., Balanced assignment problems.,Unbalanced assignment problems. Traveling salesmen problem.

TEXTBOOKS:

1. Advance Engineering Mathematics by Erwin Kreyszig (WileyIndia).
2. Mathematical Methods of Science and Engineering, by Kanti B. Datta(Cengage Learning)
3. Advanced Engineering Mathematics, 3e, by Jack Goldberg (OxfordUniversity Press).
4. Engineering Mathematics by V. Sundaram (VikasPublication).
5. Higher Engineering Mathematics, by B. S. Grewal (Khanna PublicationDelhi).
6. Higher Engineering Mathematics, by B. V. Ramana (TataMcGraw-Hill).
7. Advanced Engineering Mathematics, by H. K. Das (S. ChandPublication).
8. Fuzzy Sets and Fuzzy Logic: Theory and Applications, by George J. Klir andBo Yuan (Prentice Hall of India Private Limited).
9. Applied Mathematics by Navneet D. Sangle (CengagePublication)

Discrete Mathematics & Structures

Discrete Mathematics & Structures (PCC-CS302)

Credits:- 4

1 Mathematical Logic:

Statements & Notations, Connectives, Statement Formulas & truth table, Well formed formulas, Tautologies , Equivalence of formulas, Duality law, Tautological Implications, Functionally complete set of connectives, Other connectives, Normal Forms, Theory of Inference for statement calculus.

2 Set Theory:
Basic concepts of set theory, Operations on Sets, Ordered pairs & n-tuples, Cartesian product

3 Relations & Functions:
Relations. Properties of binary relations. Matrix & Graph Representation of Relation., Partition & covering of Set, Equivalence Relations. , Composition of Binary Relation., POSET & Hasse Diagram, Functions, Types of Functions, Composition of functions..

4 Algebraic Systems:
Algebraic Systems: Examples & general Properties, Semi groups &

Monoids, Groups: Definitions & Examples, Subgroup & Homomorphism.

5 Lattice and boolean algebra
Lattice as partially ordered sets, Lattice as Algebraic Systems., Special Lattices., Boolean Algebra: Definitions & examples, Boolean Functions., Representation & Minimization of Boolean Functions.

6 GraphTheory:
Basic concepts of graph theory., Paths, Reachability & Connectedness, Matrix, Representations of Graphs., Storage Representation & Manipulations of Graphs. PERT & Related technologies.

Text Books:
1. “Discrete Mathematical Structures with Application to Computer Science”by J.P.Tremblay & R. Manohar (MGH International)

Reference Books:
1. Discrete Mathematics –SemyourLipschutz, Marc Lipson (MGH), Schaum’s outlines.
2. Discrete Mathematics and its Applications – Kenneth H. Rosen (AT&T Bell Labs) (mhhe.com/rosen)

3. Discrete Mathematical Structures – Bernard Kolman, Robert Busby, S. C. Ross and Nadeemur- Rehman (PearsonEducation)

Data Structures

Data Structures (PCC-CS303)

Credit:-3

1 Basic of Data Structures

Data structure- Definition, Types of data structures, DataStructureOperations, Algorithms: Complexity, Time and Space complexity.

2 Searching and Sorting Techniques
Linear search, Binary search, Hashing – Definition, hash functions, Collision, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort, Radix sort, Complexity and analysis.

3 Stacks and queues
Stack: Definition, operations, Array representation of stack, applications Queue: Definition, operations, Array representation of queue,applications,Circular queue, Priority queue, Deque.

4 Linked Lists
Definition, representation, operations, implementation and applications of singly, doubly and circular linked lists. Linked representation of stack and Queue.

5 Trees
Terminology, representation, binary tree, traversal methods, binary search tree, AVL search tree, B tree, B+ tree, Heaps- Operations and their applications, Heap sort.

6 Graphs:
Basic concept of graph theory, storage representation, graph traversal techniques- BFS and DFS, Graph representation using sparse matrix.

TEXT BOOKS:
1. Schaum's Outlines Data Structures – Seymour Lipschutz (MGH)

REFERENCE BOOKS:
2. Data Structure using C- A. M. Tanenbaum, Y. Langsam, M. J. Augenstein(PHI)
3. Data Structures- A Pseudo code Approach with C – Richard F. Gilberg and Behrouz A. Forouzon 2 ndEdition

Computer Networks – I

Computer Networks – I (PCC-CS304)

Credit:- 4

1 Introduction to Computer Network:

Overview of OSI layer Model and TCP/IP protocol model, Addressing, Underlying technologies for LANs, WANs, and Switched WANs.

2 Data Link Layer
Design issues for Data Link Layers, Framing methods, Error control: detection and correction, Flow control, Elementary Data Link protocols, Sliding window Protocols, Go back n, Selective repeat.

3 Medium Access Control Sub layer:
Static and Dynamic channel allocation, Multiple Access protocols ALHOA, CSMA, Collision Free Protocols, Ethernet: IEEE 802.3, IEEE 802.4, IEEE 802.5 standards, Wireless LANS 802.11 standards

4 Network Layer:
IPv4 Addresses: Classful Addressing Other Issues, Sub-netting and Super netting, Class less Addressing, Delivery, Forwarding and routing; Routing methods: Shortest path, Link state, Distance vector routing and broadcast routing, Congestion control algorithms: Principles, Congestion prevention policies, congestion control in datagram subnet, Load Shedding, Jitter Control.

5 Internet Protocol:
IP Datagram format,Fragmentation and reassembly models,ARP,RARP,ICMP, IGMP

6 Transport Layer:
The Transport service primitives,
UDP:Process to Process communication,User Datagram Format,Operation and uses of UDP.
TCP: TCP Services and Features, TCP segment format, TCP Connections, Flow and error control in TCP, TCP Timers; Berkeley Sockets: Socket Addresses, Elementary Socket system calls byte ordering and address conversion routines, connectionless iterative server, connection oriented concurrent server, TCP and UDP Client server Programs.

TEXT BOOKS:
1. TCP/IP protocol suit 4thEd. – Behrouz A. Forouzen (Tata Mag.Hill)
2. Computer Networks – Andrew S. Tanenbaum(PHI)
3. Unix Network Programming – W. Richard Stevens (PHI)

REFERENCE BOOKS:
1. TCP/IP Illustrated, The Protocols, Vol. I – W. Richard Stevens, G. Gabrani (PearsonEducation.)
2. Internetworking with TCP/IP, Vol. I Principles, Protocols, and Architectures – D. E. Comer (PearsonEd.)
3. Internetworking with TCP/IP, Vol. III, Client-Server Programming and Application (2nd Ed.) –D. E. Comer, David L. Stevens (Pearson Ed.)

Microprocessors

Microprocessors (PCC-CS305)

Credits:- 4

1 Architecture of 8085

Classification of Instructions, Instruction set of 8085
Introduction to 8051 Micro controllers

2 The Microprocessor and its Architecture:
a) Internal Microprocessor Architecture b) Real Mode Addressing
Addressing Mode:
a) data Addressing Mode b) Program Memory Addressing Mode
c) Stack memory Addressing mode..

3 Data movement Instruction , PUSH and POP , Load Effective Address
String Data Transfer Arithmetic Instruction: a) Addition b) Subtraction c)Comparison d) Multiplication e) Division
BCD & ASCII Arithmetic, AssemblerDetails.

4 Logic & Program Control Instruction:
a) Basic LogicInstruction
Shift & Rotate, Jump Group and Procedures
Machine Control & Miscellaneous Instructions
Basic Interrupt Processing, HardwareInterrupts

5 80386Microprocessor:
Introduction to 80386 Microprocessor, The Memory System
Special 80386 Registers 80386 Memory Management , Virtual 8086 Mode
Introduction to Protected Mode memory Addressing,Memory Paging Mechanism

6 Pentium Pro Microprocessor
Introduction to Pentium Pro Microprocessor,
Internal Structure of the Pentium Pro, The Memory System
Multiple Core technology.

TEXT BOOKS:
1. The INTEL Microprocessors; Architecture, Programming and Interfacing By Barry B Brey (8th Edition)
2. Microprocessors and Microcontrollers- N.Senthi Kumar, M, Saravanam and S Jeevananthan (Oxford UniversityPress)

REFERENCE BOOKS:

1. Microprocessors Architecture, Programming and Application with 8085 by Ramesh
Gaonkar

2 The Microcomputer Systems: the 8086.8088 Family By Yu Chenn A. Gibson (PHI Ltd)

C Programming

C Programming (PCC-CS306)

Credits:- 5

1 Introduction to C:

The Form of a C Program, The Library and Linking, Separate Compilation,Compiling a C Program, C's Memory Map; Expressions – The Basic Data Types, Modifying the Basic Types, Identifies Names, Variables, The Four C Scopes, Type Qualifiers-const, volatile, Storage Class Specifiers; Statements - Selection Statements, Iteration Statements, Jump Statements, Expression Statements, Block Statements.

2 Console I/O & Basics of ArrayandStrings

Console I/O: Reading and Writing Characters, Reading and Writing Strings, Formatted Console I/O, printf(), scanf(), Suppressing Input. Arrays and Strings- Two-Dimensional Arrays, Arrays of Strings, Multidimensional Arrays, Array Initialization, Variable- Length Arrays.

3 Functions:

The General Form of a Function, Understanding the Scope of a Function, Parameter passing, Passing arrays to functions, Function Arguments, argc and argv-Arguments to main(),The return Statement, What Does main( ) Return?, Recursion, Function Prototypes, Declaring Variable Length Parameter Lists, The inline Keyword.

4 Pointers:

What Are Pointers?, Pointer Variables, The Pointer 0perators, Pointer Expressions, Pointers and Arrays, Arrays of Pointers, Multiple Indirection, Initializing Pointers, Pointers to Functions and structures, C's Dynamic Allocation Functions, restrict-Qualified Pointers, Problems with Pointers.

5 Structures, Unions, Enumerations, and typedef :
Structures, Arrays of Structures, Passing Structures to Functions, Structure
Pointers, Arrays and Structures Within Structures, Unions, Bit-Fields, Enumerations, Using size of to Ensure Portability, typedef .

6 File I/O :
FileI/O,Standard C vs.UnixFileI/O,Streams and Files,File System Basics,fread() and fwrite(), fseek() and Random-Access I/O, fprintf( ) and fscanf(), The Standard Streams.

TEXT BOOKS:
1. C the Complete Reference by Herbert Schild (Tata McGraw Hill) 4thEdition.
2. The C Programming Language- Brian W. Kernighan, Dennis Ritchie 2ndEdition.

REFERENCE BOOKS:
1. Programming in ANSI C by E.Balaguruswamy.(TataMcGraw Hill)4thEdition.
2. Let Us C By Yashavant P. Kanetkar, 5thEdition.