

THIRD SEMESTER

MAT 209 ENGINEERING MATHEMATICS III

[4 0 0 4]

Boolean algebra, Lattices and Algebraic systems, Predicate Calculus, Permutations and Combinations, Generating function, Principle of inclusion and exclusion, Partitions, Compositions Lexicographical and Fikes ordering of permutations; Algorithms for generating functions; Graph Theory, Dijkstra's Algorithms; Group theory

References:

1. C.L.Liu, "Elements of Discrete Mathematics", McGraw Hill.
2. J.P. Trembaly and R.Manohar, "Discrete Mathematics Structures with application to Computer Science", MGH
3. E.S. Page and L.B.Wilson, "An Introduction to Computational Combinatorics", Cambridge University, Press.

CSE 201 COMPUTER ORGANIZATION AND DESIGN

[3 1 0 4]

Computer types, Functional units, Basic operational concepts, Bus structures, Software, Performance, Numbers, arithmetic operations and characters, Memory locations and addresses, Memory operations, Addressing modes. Addition and subtraction of signed numbers, Adders, ALU design, Bit slice processor, Multiplication of positive numbers Signed operand multiplication, Fast multiplication, Integer division, Floating point numbers and operations Introduction, Basic concepts, Design methods Basic concepts, RAM memories, Read only memories, Speed size and cost, Cache memories, Performance considerations, Virtual memories, Memory, Management Requirements, Secondary storage, Accessing I/O devices, Interrupts, Direct memory access, Buses, Interface circuits

References:

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", McGraw Hill International Edition, Fifth edition, (2002).
2. Mohammed Rafiquzzaman and Rajan Chandra, (2008) "Modern Computer Architecture", Galgotia Publications Pvt. Ltd.

CSE 203 SWITCHING THEORY & LOGIC DESIGN

[3 1 0 4]

Variables and functions, Inversion, Truth tables, Logic gates and networks, Boolean algebra, Introduction to VHDL, Synthesis using AND OR and NOT gates. Karnaugh map, Strategy for minimization, Minimization of POS forms, Incompletely specified functions, Multiple output circuits, NAND and NOR logic networks, Multilevel NAND and NOR circuits, Analysis of multilevel circuits, Positional number representation, Addition of unsigned numbers, Signed

numbers, Fast adders, Design of arithmetic circuits using VHDL, BCD representation. Multiplexer, Decoder, Encoder, Code converter, Arithmetic comparison circuits, VHDL for combinational circuits, Flip Flops, Registers, Counters, Overview of semiconductor diode, BJT, MOSFET, TTL – Standard, High speed, Low-power, Low-power schotky, CMOS logic-NAND, NOR.

References:

1. Stephen Brown and Zvonko Vranesic, “Fundamentals of Digital Logic with VHDL Design”, Tata McGraw Hill Publishing Co. Ltd., 2000.
2. Donald P. Leach, Albert Paul Malvino, Goutam Saha, “Digital Principles and Applications” Tata McGrawHill Publishing Co. Ltd., 6th Edition, 2006.
3. J. Bhasker, “A VHDL Primer”, PHI Pvt. Ltd., 3rd Edition, 2005.

CSE 205 DATA STRUCTURES USING C

[3 1 0 4]

Introduction to data structures, algorithm specification, time and space complexity, asymptotic notation. pointer fundamentals, memory allocation functions, array of pointers. type definition, enumerated types, structures, recursion in C, tower of Hanoi, GCD, fibonacci series, efficiency of recursion, implementation of stacks in C, evaluation of expressions, multiple stacks and queues, infix, postfix and prefix and their conversions, linked lists representations, singly, doubly, header node, circular, linked stacks and queues, polynomial and long integer arithmetic, set union, intersection, binary tree representation, recursive and non-recursive traversals, binary search tree, operations on binary search tree, AVL trees, expression trees, terminology and representation of Graph, spanning trees, minimum spanning tree, shortest path and transitive closure, sorting algorithms, hashing.

References :

1. Behrouz A. Forouzan, Richard F. Gilberg “A Structured Programming Approach Using C”, Thomson, 2nd Edition, 2003.
2. Aaron M. Tanenbaum, Yedidyah Langsam, Moshe J. Augenstein, “Data Structures using C”, PEARSON Education, 2006.
3. Ellis Horowitz, Sartaj Sahni, Anderson, “Fundamentals of Data Structures in C”, Silicon Press, 2nd Edition, 2007.

CSE 207 OBJECT ORIENTED PROGRAMMING USING C++

[3 1 0 4]

Introduction to C++, Object-Oriented Programming Systems, Comparison of C++ with C, Classes and Objects, Member Functions and Member Data, Objects and Functions, Objects and Arrays, Nested Classes, Dynamic Memory Management, Dynamic Memory Allocation, and Deallocation, Constructors and Destructors, Inheritance, Base Class and Derived Class Pointers, Base Class Initialization, The Protected Access Specifier, Deriving by Different Access Specifiers, Different Kinds of Inheritance, Virtual Functions and Dynamic Polymorphism,

Stream Handling, Operator Overloading, Templates, Function Templates, Class Templates, Exception Handling, C-Style Handling of Error-generating Codes, C++ Style Solution – the try/throw/catch Construct, Limitation of Exception Handling.

References:

1. Sourav Sahay, “Object-Oriented programming with C++”, Oxford University Press, reprint: 2008.
2. Stanley B. Lippman, JoseeLajoie, Barbara E.Moo, “C++ Primer”, Addison Wesley, 4th Edition, 2005.
3. Robert Lafore, “Object oriented programming in C++”, Galgotia publications, 3rd edition, 2006.

CSE 209 SWITCHING THEORY & LOGIC DESIGN LAB USING VHDL

[0 0 3 1]

Simulation of logic circuits using VHDL: Introduction toMAX+plus II, Verification of logic gates and Boolean algebra,Simplification of expressions using Kmap,Experiments on multilevel NAND, NOR circuits, Arithmetic circuits, Multiplexers Multiplexer Applications,Decoders and encoders, Code converters and comparator,Registers – Shift register, Counters – Synchronous and Asynchronous

References:

1. Stephen Brown and ZvonkoVranesic, “Fundamentals of digital logic with VHDL design”, Tata MGH 2000.
2. J. Bhasker, “A VHDL Primer”, PHI Pvt. Ltd., 3rd Edition, 2005.

CSE 211 DATA STRUCTURES USING C LAB

[0 0 3 1]

Review of C, Recursion, Stacks, Queues, Singly , doubly, circular linked lists with and without header nodes, Trees, Graphs.

References:

1. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J. Augenstein, “Data Structures Using C”, PEARSON Education, PHI 2006
2. Behrouz A. Forouzan, Richard F. Gilberg, “A Structured Programming, Approach Using C”, Thomsan, 2nd Edition, 2003.

CSE 213 OBJECT ORIENTED PROGRAMMING USING C++ LAB

[0 0 3 1]

Review of Functions, Structures, Character pointers, Classes & Objects, Friend Functions, static members, Constructors, Destructors, Dynamic Memory Management, Matrix class, Stack class, Singly and Doubly Linked List, Inheritance, Virtual Functions, Dynamic Polymorphism, Operator Overloading, Templates, Exception Handling

References:

1. Sourav Sahay, "Object-Oriented programming with C++", Oxford University Press, reprint: 2008.
2. Stanley B. Lippman, JoseeLajoie, Barbara E.Moo, "C++ Primer", Addison Wesley, 4th Edition, 2005.
3. Herbert Schildt, "C++: The Complete Reference", Tata McGraw-Hill, 4th Edition, reprint: 2005.

FOURTH SEMESTER

MAT 212 ENGINEERING MATHEMATICS IV

[4 0 0 4]

Probability, distributions, Moment generating functions, functions random variables F and T DISTRIBUTIONS, Sampling distribution, Central limit theorem. Point estimation, MLE, Interval estimation; Test of Hypothesis: significance level, certain best tests. Stochastic Process, classification statistics of stochastic process, stationary and Ergodic Process.

References :

1. P.L.Meyer, "Introduction to Probability and Statistical Applications", IBH
2. K.S.Trivedi, "Probability, Statistics with Reliability, Queuing and Computer Science applications", PHI
3. Miller, Freund and Johnson, "Probability and Statistics for Engineers", PHI

CSE 202 FORMAL LANGUAGES AND AUTOMATA THEORY

[3 1 0 4]

Introduction to the Theory of Computation and Finite Automata, Deterministic Finite Accepters, Nondeterministic Finite Accepters, Equivalence of Deterministic and Nondeterministic Finite Accepters, Regular languages, regular grammars and properties of regular languages, Regular Expressions, Closure Properties of Regular Languages, Identifying Nonregular Languages. Context-free languages and simplification of context-free grammars and normal forms, Parsing and Ambiguity, Methods for Transforming Grammars, Nondeterministic and Deterministic Pushdown Automata, Turing machines and other models of turing machines, A hierarchy of formal languages & automata and limits of algorithmic computation, Recursive and Recursively Enumerable Languages, Unrestricted Grammars, Context Sensitive grammars and Languages, The Chomsky Hierarchy.

References:

1. Peter Linz, (2006), "An Introduction To Formal Languages and Automata", Fourth Edition, Narosa Publishing House.
2. John C Martin, (2002), "Introduction to Languages and the Theory of Computation", Third Edition, McGraw Hill.
3. J E Hopcroft, Rajeev Motwani & Jeffrey D Ullman, (2006), "Introduction to Automata Theory, Languages and Computation", 3rdEdn. Pearson Education.

CSE 204 RELATIONAL DATABASE MANAGEMENT SYSTEMS

[3 1 0 4]

Database-System Applications, Relational Databases, Database Design, Transaction Management, Database Architecture. Relational-Algebra Operations, Extended Relational-Algebra Operations, Null Values, Modification of the Database. Data Definition, SQL Data Types, Integrity Constraints, Set Operations, Aggregate Functions, Null Values, Complex Queries, Joined Relations, Overview of the Design Process, The Entity-Relationship Model, Constraints, E-R Diagrams, Design Issues, Weak Entity Sets, Extended E-R Features, Relational Database Design, Atomic Domains and First Normal Form, Functional Dependency Theory, Algorithms for Decomposition, Physical Storage Media, File Organization, Static and Dynamic Hashing, Transaction Management- Implementation of Atomicity and Durability, Recoverability, Recovery algorithms.

References:

1. Silberschatz, Korth, Sudarshan, "Database System Concepts", McGrawHill, 6th Edition, 2011.
2. Ramez Elmasri and Shamkant Navathe, Durvasula V L N Somayajulu, Shyam K Gupta, "Fundamentals of Database Systems", Pearson Education, 2006.
3. Thomas Connolly, Carolyn Begg, "Database Systems – A Practical Approach to Design, Implementation and Management", Pearson Education, 3rd Edition, 2002.
4. Peter Rob, Carlos Coronel, "Database Systems – Design, Implementation and Management", Thompson Course Technology, 7th Edition, 2007.

CSE 206 MICROPROCESSORS

[3 1 0 4]

8086 internal architecture, programming the 8086, Addressing modes, assembler and Assembler directives, Instruction timing and delay loops, String instructions, Procedures and Macros, 8086 Interrupts and Interrupt Responses, 8259 Priority Interrupt Controller, 8254 Software-Programmable Timer/counter, Software interrupts: DOS 21h functions, BIOS INT 10h display and input functions and Programming examples. Functional diagram, reset and wait state, Min and Max mode operation, timing diagrams. 8255- Programmable Parallel Interface, 8087 Math Coprocessor, ISA, PCI, USB Bus, AGP, 80286, 80386, Pentium Processors-Architecture, Real PVAM mode, Task protection and Task Switching, Paging, 68000 Architecture, addressing modes, Instruction set, Simple assembly language programs.

References:

1. Douglas V. Hall, "Microprocessors and Interfacing", Tata McGraw Hill Publications Ltd., Revised Second Edition 2006.
2. Barry B. Brey, "The Intel Microprocessors", Seventh Edition, Prentice Hall India, 2005.
3. Alan Clements, "Microprocessor system design 68000 Hardware, Software, and Interfacing", PWS Publishing Company, Third Edition, 1997.

CSE 208 EVENT DRIVEN PROGRAMMING USING JAVA

[3 1 0 4]

Object Oriented Programming, Byte Code Concept, A First Simple Java Program, Data Types, Variables and Arrays, Operators, Control Statements, Classes and Methods, Inheritance, Packages, Interface, Exception Handling, Multithreaded Programming, File Handling, Input/Output Stream, File Input/Output Stream, Character Stream, File Reader, File Writer, Serialization, Applet Class, Event Handling, Event Class, Source Of Events, Event Listeners, Adapter Classes, Inner Classes, Introduction to AWT: Working with Windows And Graphics, Using AWT Controls, Layout Managers, Menus, Introducing Swing, Exploring Swing, Icons And Labels, Text Fields, Buttons, Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables.

References:

1. Herbert Schildt, "The Complete Reference Java Seventh Edition", Tata McGraw-Hill, reprint 2007.
2. Paul Deitel and Harvey Deitel, "Java How To Program", Prentice Hall, 9th edition, 2012.
3. Steven Holzner, "Java 2 programming black book", Dream Tech, NewDelhi, reprint: 2005.

CSE 210 MICROPROCESSORS LAB

[0 0 3 1]

Basics of Assembly Programming, Simple Programs using Addition, Subtraction and Branching Instructions, Operations on BCD and ASCII, Multiplication and Division List Operations (Arrays), String Operations, DOS and BIOS, Interfacing experiments - Logic Controller , DAC, Keyboard Interfacing, Seven Segment Display, Stepper Motor, ADC, Elevator Interfacing

References:

1. Douglas V. Hall, "Microprocessors and Interfacing", Tata McGraw Hill Publications Ltd., Revised Second Edition, 2006.
2. Respective User Manual for the interfacing kit.

CSE 212 JAVA PROGRAMMING LAB.

[0 0 3 1]

Programs on control statements and arrays, Programs on classes and methods, Programs on stacks and lists , Programs on strings, Programs on Inheritance and Packages, Programs on Interfaces, Programs on Exception Handling, Programs on Multithreaded programming, Programs on Input/Output Streams, Programs on Applet Class and Event Handling, Programs involving AWT, Programs involving Swings.

References:

1. Herbert Schildt , “The Complete Reference Java Seventh Edition”, Tata McGraw-Hill, reprint 2007.
2. Steven Holzner, “Java 2 programming black book”, Dream Tech, NewDelhi, reprint: 2005.
3. John R. Hubbard, “Programming With Java”, Schaum’s outlines, Tata McGraw-Hill, 2nd edition, reprint: 2011.

CSE 214 RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB**[0 0 3 1]**

DB application development with MS Access, Experiments on DDL and Basic SQL, Advanced SQL, ER diagrams using DIA tool, Data Integrity Constraints and Built-in Functions, Design and Implementing the data requirements of a simple DB application, Experiments on Basic PL/SQL, PL/SQL Exceptions and PL/SQL Cursors, PL/SQL Procedures, Functions and Packages, DB application development with Java as front end.

References:

1. Thomas Connolly, Carolyn Begg, “Database Systems – A Practical Approach to Design, Implementation and Management”, Pearson Education, 3rd Edition, 2002.
2. Peter Rob, Carlos Coronel, “Database Systems – Design, Implementation and Management”, Thompson Course Technology, 7th Edition, 2007.
3. Ivan Bayross, “SQL, PL/SQL”, BPB Publications, 3rd Revised Edition, 2005.

V SEMESTER**CSE 301 DESIGN AND IMPLEMENTATION OF PROGRAMMING LANGUAGES****[3 1 0 4]**

What is a Programming Language?, Abstractions in Programming Languages, Computational Paradigms, Language Definition, Language Translation, History and Design Criteria, Efficiency, Regularity, Further Language Design Principles Lexical Structure of Programming Languages, CFGs and BNFs Parse Trees and Abstract Syntax Trees, Ambiguity, Associativity, and Precedence EBNFs and Syntax Diagrams, Attributes, Binding, and Semantic Functions, Declarations, Blocks, Name Resolution and Overloading, Allocation, Lifetimes, and the Environment, Variables and Constants, Aliases, Dangling References, and Garbage, Data Types, Expressions and Statements, Object-Oriented Programming, Functional Programming, Logic Programming, Parallel Programming.

References:

1. Kenneth C. Loudon “Programming Languages Principles and Practice” Thomson Brooks/Cole Publication, Second Edition.
2. Harold Abelson, Gerald Jay Sussman and Julie Sussman, “Structure and Interpretation of Computer Programs”, MIT Press, 2nd Edition, 1996

3. Robert W. Sebesta, “Concepts of Programming Languages”, Addison-Wesley, Ninth Edition, 2010
4. Michael L. Scott, “Programming Language Pragmatics”, Morgan Kaufmann Publishers, Third edition, 2009.

CSE 303 DESIGN & ANALYSIS OF ALGORITHMS

[3 1 0 4]

Fundamentals of Algorithm and Data Structures, Analysis Framework- Asymptotic Notations and Basic Efficiency Classes, Mathematical Analysis of Nonrecursive and Recursive Algorithms, Divide and Conquer- Mergesort, Quicksort, Binary Search, Decrease and Conquer- Insertion Sort, Depth First Search, Breadth First Search, Topological Sorting, Transform and Conquer - Presorting, Balanced Search Trees, Heaps and Heapsort, Problem Reduction, Space and Time Tradeoffs- Sorting by Counting, Input Enhancement in String Matching, Dynamic Programming , Greedy Techniques, Limitations of Algorithm Power, Lower-Bound Arguments, Decision Trees P, NP and NP Complete Problems, Coping with the Limitations of Algorithm Power.

References:

1. AnanyLevitin, “Introduction to The Design and Analysis of Algorithms”, Pearson Education, 2nd Edition, 2007.
2. Horowitz E., Sahni S., RajasekaranS.,”Computer Algorithms”, Galgotia Publications, 2001.
3. Thomas H. Cormen, Charles E. Leiserson, Ronal L, Rivest, Clifford Stein, “Introduction to Algorithms”, PHI, 2nd Edition, 2006.

CSE 305 SOFTWARE ENGINEERING

[3 1 0 4]

Introduction to Software Engineering, The Evolving Role of Software, The changing nature of software, Legacy software, Software Myths, Generic View of Process, Software Engineering – A Layered Technology, A Process Framework, The Capability Maturity Model Integration (CMMI), Process models, Unified Process, Agile view of process, Agile Process Models, Software Engineering Practice, Communication Practice, Planning Practices, Modeling Practices, Construction Practice, Deployment, System Engineering, Computer Based Systems, The System Engineering Hierarchy, Business Process Engineering, Requirements Engineering, Building the Analysis model, Object Oriented Analysis, Scenario-Based, Flow-Oriented, Class – Based, Design Engineering, Software Testing, Software Quality, Software cost estimation, Project Planning and control

References:

1. Roger S Pressman, "Software Engineering: A Practitioners Approach", McGrawHill Publications, 6th Edition.
2. Hans Van Valiet, "Software Engineering: Principles and Practice", Wiley India, 3rd Edition.

CSE 307 COMPUTER GRAPHICS**[3 1 0 4]**

Overview of graphics systems, Raster scan systems, Introduction to OpenGL, Graphics Ouptut Primitives, .Line drawing, Circles and Ellipses generating, Polygon fill algorithms, Scan line fill of convex polygons and regions with curved boundaries, Filling of areas with irregular boundaries. 2D transformations, Geometric transformations in 3D space, Affine transformations, Curve and Text clipping. 3D viewing pipeline, Projection transformations, Orthographic projections, Depth buffer, Scan line method, Depth sorting method, BSP tree method, Area subdivision method. Light sources, Ambient light, Diffuse reflection, Specular reflection and Phong model, Shadows, Displaying light intensities, Halftone patterns and Dithering techniques, Basic ray tracing algorithm. Animation

References:

1. Donald Hearn, Pauline Baker M., "Computer Graphics with OpenGL", Pearson Education, 3rd Edition, 2010.
2. Edward Angel, "Interactive Computer Graphics- A top down approach using OpenGL", Pearson Education, 5th Edition, 2009.
3. Foley J. D., VanDam A., Feiner S. K., Hughes J. F., "Computer Graphics, Principles and Practice", Addison-Wesley, 2nd Edition 2004.

CSE 309 OPERATING SYSTEM AND LINUX**[3 1 0 4]**

Operating Systems and its operations, Special Purpose Systems. O.S services, User O.S Interfaces, System Calls, System Programs, O.S Structure, Virtual Machines, System Boot Process Concepts, scheduling, Operations on Processes, Interprocess Communication, Multithreaded Models, Thread Libraries, Threading Issues, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling, Linux Scheduling, Algorithm Evaluation Background, Classical problems of synchronization, Deadlock Characterization, Methods for handling deadlocks, Contiguous Memory Allocation, Paging, Segmentation, Demand Paging, Copy-On-Write, Page Replacement, Allocation of Frames, Thrashing, File Concept, Access Methods, Directory Structure, File System, Access Matrix and Implementation, The Security Problem, Program Threats, System and Network threats, User Authentication, Linux systems

References:

1. A. Silberschatz, P. B. Galvin and G. Gagne, "Operating System Concepts", International student version, Wiley India Student Edition, Eighth Edition, 2009.
2. William Stallings, "Operating Systems: Internals and Design Principles", Pearson Ed., LPE, Sixth Edition, 2009.

3. D. M. Dhamdhere, "Operating Systems: A Concept Based Approach", Tata McGraw-Hill publications, Second Edition, 2006.

CSE 311 COMPUTER COMMUNICATION & NETWORKS

[3 1 0 4]

Uses of Computer Networks, Network Hardware, Network Software, Reference Models. Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments, Channel Capacity, Decibels and Signal Strength, Guided Transmission Media, Wireless Transmission. Digital Data, Digital Signals, Digital Data, Analog Signals. Asynchronous and Synchronous Transmission, Types of errors, Error Detection, Flow Control, Error Control, Performance Issues. Frequency Division Multiplexing, Synchronous Time Division Multiplexing- Characteristics only, Statistical Time Division Multiplexing. The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANs. Network Layer Design Issues, Routing Algorithms, Congestion Control algorithms.

References:

1. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill 4th Edition .2006
2. Andrew S. Tanenbaum, " Computer Networks", 5th Edition, 2010 Prentice Hall of India Pvt. Ltd.
3. William Stallings, "Data and Computer Communications", 7th Edition, 2004 Prentice Hall of India Pvt. Ltd.

CSE 313 DESIGN AND ANALYSIS OF ALGORITHMS LAB

[0 0 3 1]

Review of fundamental data structures, Fundamentals of algorithmic problem solving, Brute force techniques, Divide and Conquer, Decrease and Conquer, Transform and Conquer, Space and Time tradeoffs, Dynamic Programming, Greedy Technique, Backtracking, Branch and Bound

References:

1. AnanyLevitin, "Introduction to The Design and Analysis of Algorithms", Pearson Education, 2nd Edition, 2007.
2. Horowitz E., Sahni S., RajasekaranS., "Computer Algorithms" Galgotia Publications, 2001.
3. Thomas H. Cormen, Charles E. Leiserson, Ronal L, Rivest, Clifford Stein, "Introduction to Algorithms", PHI, 2nd Edition, 2006.

CSE 315 COMPUTER GRAPHICS LAB

[0 0 3 1]

Understanding OpenGL and programs to draw objects, Line drawing algorithms, Midpoint Circle and Ellipse algorithms, Polygon filling algorithms, Line and Polygon clipping algorithms, 2D transformation functions, 3D transformation functions, Transformation of user defined objects in 2D and 3D, 2D curves, Effects of lighting in OpenGL, Programs for illustration of graphical principles using OpenGL, Creating animation programs

References:

1. Donald Hearn, Pauline Baker M., "Computer Graphics with OpenGL", Pearson Education, 3rd Edition, 2009.
2. Edward Angel, "Interactive Computer Graphics- A top down approach using OpenGL", Pearson Education, 5th Edition, 2009.
3. Dave Shreiner, The Khronos OpenGL ARB Working Group, Bill Licea-Kane, Graham Sellers, "OpenGL Programming Guide: The Official Guide to Learning OpenGL", Addison-Wesley Professional, 8th Edition, Version 4.1 2011.

CSE 317 OPERATING SYSTEM AND LINUX LAB

[0 0 3 1]

Testing the use of UNIX commands. UNIX shell commands. Basics of Shell Programming, UNIX System Calls. CPU Scheduling Algorithms, Deadlock Detection Algorithms, Deadlock Avoidance Algorithms, Page Replacement Algorithms, Memory Allocation Algorithms, Disk Scheduling Algorithms, UNIX InterProcess Communication.

References:

1. Graham Glass. "Unix for Programmers and Users – A Complete Guide", Pearson Education, Third Edition.
2. Maurice J. Bach, "Design of Unix Operating System", Prentice Hall 1986.
3. A. Silberschatz, P. B. Galvin and G. Gagne, "Operating System Concepts", International student version, Wiley India Student Edition, Eighth Edition, 2009.
4. Rachel Morgan, "Unix System V", Tata McGraw Hill, TMH 2000.

VI SEMESTER

HSS 302 ESSENTIALS OF MANAGEMENT AND ENGINEERING ECONOMICS

[3 1 0 4]

Management –Definition of Management, Nature and scope of Management, Functions of managers, Corporate social responsibility, Theories of Planning, Organizing, Staffing, Leading and Controlling. Engineering Economics-Introduction to micro and Macro Engineering Economics, Value, Utility, Consumer and Producer goods, Factors of production, Law of demand and supply, Elasticity of demand and supply, Equilibrium of demand and supply, Time value of money, Economic Evaluation of Alternatives, Replacement Analysis and depreciation

References:

1. Koontz.D., “Essentials of Management”, McGraw Hill, New York
2. Peter Drucker, “Management Task and Responsibility”, Allied Publishers
3. Tunesen G.J. And Tunesen H.J., “Engineering Economy”, Prentice Hall of India, New Delhi
4. De Garmo L.Paul, “Engineering Economy”, Macmillan New York

CSE 302 LANGUAGE PROCESSORS

[3 1 0 4]

The Structure of a Compiler, Role of the Lexical Analyzer, Specification of Tokens, Recognition of Tokens, The Lexical-Analyzer Generator Lex, Finite Automata, From Regular Expression to Automata. Context-Free Grammars, Top-Down Parsing, Bottom-Up Parsing, Using Ambiguous Grammars, Parser Generators.Syntax-Directed Definition, Construction of Syntax Trees.Variants of Syntax Trees, Three-Address Code, Types and Declarations: Type Expressions, Type Equivalence, Translation of Expressions, Operations within Expressions, Type Checking.Storage Organization,Issues in Code Generator, Target language Addresses, Basic Blocks and Flow Graphs.Elements of Assembly Programming, Design of Two Pass Assemblers.

References:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education, 2nd edition. 2010
2. D M Dhamdhare, “Systems Programming and Operating Systems”, Tata McGraw Hill, 2nd Revised Edition, 2001.
3. Kenneth C. Loudon, “Compiler Construction - Principles and Practice”, Thomson, India Edition, 2007.

CSE 304 NETWORK PROTOCOLS

[3 1 0 4]

IP Addresses,Introduction, Classful addressing, Subnetting Classless addressing, variable length blocks, Subnetting, address allocation,ARPOperation, ARP package and RARP, Internet Protocol(IPv4), fragmentation, options, checksum, IP Package,ICMP, Types of messages, message format, error reporting, Query, Checksum, Debugging tools, UDP-checksum, operation, package, services, features, segment, connection, State transition diagram, Flow control, Error

control, Congestion control, timers, options, TCP package, SCTP services, features, packet format, association, state transition diagram, flow control, error control, congestion control, DNS,-Name space, domain name space, DNS in the internet, resolution,DDNS messages, TELNET-NVT,mode of operation, user interface, security issues,FTP and TFTP, HTTP, Mobile IP, Ipv6- address space assignment, ICMPv6,Transition from IPv4 to IPv6.

References:

- 1.Behrouz A. Forouzan “TCP/IP Protocol Suite”, TMH, 4th Edition, 2005.
2. Peter Loshin, “IPV6 Clearly Explained” , Morgan Kauffman, 1999.
3. C.E.Perkins, “Mobile IP Design Principles and Practices”, Addison Wesley Wireless Communications Series, 1998

CSE 306 PARALLEL COMPUTER ARCHITECTURE AND PROGRAMMING

[3 1 0 4]

Introduction to pipelining, Instruction-Level Parallelism, Reducing branch costs with dynamic hardware prediction, Multiprocessors and thread level parallelism: Symmetric shared memory architectures, multiprocessor cache coherence, Snooping protocols, Memory consistency, Relaxed consistency models. Introduction to multi core architecture: Hyper threading technology, Amdahl’s law. Fundamental concepts of parallel programming: Task decomposition, Data decomposition, Data flow decomposition. Threading and parallel programming constructs: Synchronization, Critical sections, Deadlock, Synchronization primitives, Implementation-dependent threading features. Threading APIs, Creating and Managing threads, Thread pools, Thread synchronization.OpenMP: Challenges, Minimizing threading overhead, Library functions, environment variables.

References:

1. J. L. Hennesey and D. A. Patterson, “Computer Organization and Design. The Hardware/Software Interface”, Morgan Kaufmann Publishers, 3rd Edition,2005.
2. J. L. Hennesey and D. A. Patterson, “Computer Architecture: A Quantitative Approach,” Morgan Kaufmann Publishers, 3rd Edition,2005.
3. ShameemAkhter, Jason Roberts, “Multi-Core Programming: Increasing Performance through Software Multi-threading”, Intel Press, 2006.
4. Michael JQuinn, “Parallel Programmingin C with MPI and OpenMP”, Tata McGraw Hill

CSE 308 LANGUAGE PROCESSORS LAB

[0 0 3 1]

Preliminary Scanning Applications, Design & Implementation of Lexical Analyzer, Design & Implementation of Parser, Implementation of Code Generator, Programs using LEX, Programs using YACC.

References:

1. V. Aho, R. Sethi and J. D. Ullman, “Compilers - Principles, Techniques and Tools”, Pearson Education, 2010
2. Kenneth C. Louden, “Compiler Construction - Principles and Practice”, Thomson, India Edition , 2007.

CSE 310 COMPUTER NETWORKS LAB**[0 0 3 1]**

Programs on UNIX/LINUX file API's, Client-Server Programming using TCP and UDP, Implementation of Data Encapsulation, De-capsulation, fragmentation in TCP/IP, Networking basics:(IN LINUX OS)Basic Network Configurations: Assigning IP address, Subnet Mask, gateway address, LAN behind proxy, Connecting to InternetNetwork Server Configurations:(IN LINUX OS) Web Server/Telnet/SSH Server, FTP/TFTP Server, DHCP Server, DNS Server, Database Server (MySQL/PostGreSql), Squid.

References:

1. W. Richard Stevens, “ Unix Network Programming”, Vol. 1 & 2,PE
2. W R Richard Stevens, “Advanced Programming in UNIX environment” , PE

CSE 312 PARALLEL PROGRAMMINGLAB**[0 0 3 1]**

Solving problems using Semaphores, deadlock problems using Semaphores, Locks, Condition Variables, Thread creation and management using Win32 / .NET, Solving problems using threads in Win32 / .NET, Pthread creation in Linux / windows, Pthread management, Solving synchronization problems using Pthread synchronization primitives, OpenMP parallel pragma, work sharing constructs, library routines and environment variables, A linear algebra problem solution using OpenMP.

References:

1. ShameemAkhter, Jason Roberts, “Multi-Core Programming: Increasing Performance through Software Multi-threading”, Intel Press, 2006.
2. Michael J Quinn, “Parallel Programmingin C with MPI and OpenMP”, Tata McGraw Hill
3. Online tutorial in <https://computing.llnl.gov/tutorials/pthreads/>
4. Online tutorial in <https://computing.llnl.gov/tutorials/openMP/>

VII SEMESTER

CSE 401 DISTRIBUTED COMPUTING SYSTEMS

[3 1 0 4]

Distributed system Introduction, Goals, Hardware Concepts, Software Concepts, Client-Server Model and Communications, Inter Process Communication-External Data Representation, Group Communication, distributed object and remote Invocation, Communication between Distributed Object, Remote Procedure call, Event and notifications, Processes, Code Migration, Software Agents, Distributed file system, File Service architecture, Name services and DNS, Directory and Discovery services, Case Study of GNS, Synchronization, Consistency and replication, Data-centric and Client-Centric Consistency Models, Protocols, Fault tolerance, Process Resilience, Reliable Client-Server and Group Communication, Distributed Commit, Recovery, Security, Access control.

References:

1. Ajay D. Kshemkalyani, MukeshSinghal, “Distributed Computing: Principles, Algorithms, and Systems”, Cambridge University Press/ Foundation Books India , New Delhi, 2008.
2. Mei- Ling Liu, “Distributed Computing: Principles and Application”, Pearson Education, Inc. New Delhi. 2004.
3. Coulouris George, Dollimore Jean, Kindberg Tim: “Distributed Systems, Concepts and Design”: Pearson Education Asia (LPE) 5th edition, 2011.
4. Andrew S Tannenbaum, Maarteen Van Steen: “ Distributed Systems, Principles and Paradigms”: Pearson Education Asia: (LPE) 1st Indian Reprint 2005.

CSE 403 ADVANCED INTERNET TECHNOLOGY

[3 1 0 4]

Introduction to SQL, HTML, ASP, ASP.NET, The .NET Framework, The Visual Basic Language, Types, Objects, and Namespaces , Developing ASP.NET Applications- Visual Studio, Web Form Fundamentals, Web Controls, State Management Tracing, Logging and Error Handling, Deploying ASP.NET Applications, Styles, Themes, and Master Pages, ADO.NET Data access, Data Binding, Data List, Data Grid, The Data Controls, Files and Streams, email, XML, Webservices architecture, Membership, Profiles, Advanced ASP.NET, Component-Based Programming, Caching, Implementing security

References:

1. Matthew MacDonald, “Beginning ASP.NET 4.0 in VB 2010 (Expert's Voice in .NET)” Apress, 2010.
2. Rick Leinecker, “ASP.NET Solutions-23 case studies,” Pearson Education Inc., 2004.
3. Elliotte Rusty Harold & W. Scott Means “XML In a nutshell,” O’Reilly 3rd Edition, 2005.

CSE 405 OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

[3 1 0 4]

Analyst as a Business Problem Solver, The Systems Development Life Cycle, Methodologies, Models, Tools and Techniques, The UP Disciplines, Project Management and Inception phase, The Requirements Discipline, Systems requirements, Models and Modeling, Techniques for Information Gathering, Validating the Requirements, The UML Class Diagram, Use Cases, the Domain Model and Iteration Planning, Detailed Object oriented Requirements , Definitions, Moving from Business Modeling to Requirements to Design, Understanding the Elements of Design, Design Discipline Activities, Use case realization, , Design Classes and Design Class Diagrams, Advanced topics in OOD, Designing data management layer, Human Computer interaction layer design.

References:

1. Mike O'Docherty, "Object Oriented Analysis and Design-Understanding System Development with UML 2.0", Wiley, India
2. Ali Bahrami, "Object Oriented Systems Development using the unified modeling language", McGraw Hill International Edition, 1999.
3. Jackson, Burd, Satzinger , "Object Oriented Analysis and Design with Unified Process", Cengage Learning, Fourth Indian Reprint 2011
4. Alan Dennis, Barbara Haley Wixom, David Tegarden, "System Analysis and Design with UML Version 2.0: An Object Oriented Approach", Wiley-India, Second Edition, 2005.

CSE 407 ADVANCED INTERNET TECHNOLOGY LAB

[0 0 3 1]

Hyper Text Markup Language (HTML) Tags, Visual Basic Programming, Web Forms and Web Controls, State Management, Validation, Rich Controls and User Controls, Styles, Themes and Master Pages, Working with Data, Mini Project

References:

1. Mathew MacDonald, "Beginning ASP.NET 4.0 in VB 2010 (Expert's Voice in NET)" Apress, 2010.
2. Imar Spaanjaars, "Beginning ASP.NET 4: in C# and VB (Wrox Programmer to Programmer)," Wrox Press Ltd., 1st edition, 2010.
3. Rick Leinecker, "ASP.NET Solutions-23 case studies," Pearson Education Inc., 2004.

CSE 409 OBJECT ORIENTED ANALYSIS & DESIGN LAB

[0 0 3 1]

Object Oriented Programs on Inheritance, Problem Statement and Requirements Elicitation, Class Diagram, Use case Diagram, Sequence Diagram, Collaboration Diagram, Activity Diagram, Component and Deployment Diagrams, Generate and implement the Code, Demonstration of the Project.

References:

1. Grady Booch, James Rumbough, Ivar Jacobson, "The Unified Modelling Language User Guide". Pearson Education 2002.
2. Hans-Erik Eriksson, Magnus Penker- "UML Toolkit". John Wiley and Sons Inc, 1998 Edition.

CSE 411 SEMINAR

[0 0 3 1]

Each student has to present a seminar individually, on any technical topic related to the subject, but not covered in the syllabus. The time duration for presentation is 20 minutes and 10 minutes is devoted for question and answer session. Slides have to be prepared for the presentation. A seminar report has to be submitted a week before the day of the presentation.

References:

IEEE transactions, Technical journals, Proceedings of National and International Conferences, appropriate web sites.

NOTE: The seminar evaluation is carried out in 7th semester of B.E Course and grade is included in 8th semester grade sheet.

VIII SEMESTER

CSE 402 INDUSTRIAL TRAINING

[0 0 0 1]

The Students are supposed to take up industrial training of 3-4 weeks duration before the beginning of the 7th semester. Training may be taken up in parts during vacations before 7th Semester. Internships/Training/Workshops of similar durations are to be considered for Industrial Training. The evaluation is carried out in 7th semester and the obtained grade included in 8th semester grade sheet.

CSE 499 PROJECT WORK / PRACTICE SCHOOL

[0 0 0 20]

The role of this course is not only to impart and induce practical know how but also extract the inherent capabilities and talents of an engineering student so as to apply in practical fields for the research and development. Project work incites a triggering impulse in an engineering student for onset of his future professional carrier as an engineer.

Students are required to undertake innovative and research oriented projects employing software engineering approach, which they can carry out either in an industry or reputed national research laboratory or in the college.

This course provides the students with the opportunity to work on a project from conception through implementation and testing of a prototype. The emphasis in this course is the analysis, design and implementation as per software engineering guidelines. It is expected that each project group will have a working prototype to demonstrate by the end of this course.

References:

1. Fincher S., Petre M. & Clark M.,“ComputerScience project work: Principles and pragmatics”, London, Springer, 2001.

PROGRAMME ELECTIVES

CSE 320 DIGITAL IMAGE PROCESSING

[3 1 0 4]

Fundamental Steps in Digital Image Processing, Examples, Components of an Image Processing System, Elements of Visual Perception, Image Sampling and Quantization, Relationships between Pixels, Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations, Spatial Filters- Smoothing & Sharpening, Combining Spatial Enhancement Methods, Introduction to the Fourier Transform and the Frequency Domain, Smoothing and Sharpening Frequency-Domain Filters, Noise models, Restoration, Periodic noise reduction by frequency domain filtering, Degradation Function, Morphological Image Processing, Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Morphological Watersheds Fundamentals, Image compression: Error free and Lossy compression.

References:

1. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", Pearson Education, Third Edition, 2008.
2. Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, "Digital Image Processing Using MATLAB", McGrawHill Publication, Second Edition, 2010.
3. Milan Sonka, Vaclav Hlavac, Roger Boyle, "Digital Image Processing and Computer Vision", Cengage Learning, India Edition, 2011.

CSE 322 ADVANCED DATABASE SYSTEMS

[3 1 0 4]

Query Processing-Measures of Query Cost, Selection, Sorting and Join Operations, Evaluation of Expressions, Query Optimization, Transformation of Relational Expressions, Estimating Statistics of Expression Results, Choice of Evaluation Plans, Concurrency control, Deadlock Handling, Insert and Delete Operations, Recovery system, Failure Classification, Recovery and Atomicity, Log-Based Recovery, Data Warehousing, Data Mining, Information Retrieval, Object Based Databases, Data Types, Inheritance, Object Identity and Reference Types, Persistent Programming Languages, Distributed databases, Transactions, Commit protocols, Concurrency control, Availability, Query processing, XML-Document Schema, Storage of XML Data, Emerging Database Technologies and Applications.

References:

1. Silberschatz, Korth and Sudarshan, "Database System Concepts", McGrawHill, Sixth Edition.
2. Elmasri and Navathe, "Fundamentals of Database Systems", Addison-Wesley, Fifth Edition.
3. C.J.Date, "An Introduction to Database Systems", Pearson M Education Asia, Seventh Edition.

CSE 324 CRYPTOGRAPHY AND NETWORK SECURITY

[3 1 0 4]

Computer Security Concepts, The OSI Security Architecture, Security Attacks, Services, Mechanisms, Model for Network Security, Symmetric Cipher Model, Substitution Transposition Techniques, Block Ciphers, DES, The Strength of DES, AES - Structure, Round Functions, Key Expansion, Example, Block Cipher Operation- Multiple Encryption and Triple DES, Modes- ECB, CBC, CFB, OFB, Pseudorandom Number Generators, Stream Ciphers, Public-Key Cryptography and RSA, Diffie-Hellman Key Exchange Applications of Cryptographic Hash Functions, Authentication Requirement, Message Authentication Function, Codes, Digital Signatures Transport-Level Security- Web Security Issues –SSL, TLS, Electronic Mail Security, PGP, IP Security-Overview, Policy, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange

References:

1. Behrouz A. Forouzan and Debdeep Mukhopadhyay, “Cryptography and Network Security”, McGraw Hill, 2nd Edition, 2008.
2. William Stallings, “Cryptography and Network Security: Principles and Practice”, Prentice Hall, 5th edition, 2010.

CSE 326 BUILDING ENTERPRISE APPLICATION

[3 1 0 4]

Introduction, EA types, software engineering methodologies, life cycle of raising an enterprise application, skills required to build an enterprise application, key determinants of successful enterprise applications, measuring the success of enterprise applications, inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, nonfunctional requirements, requirements validation, planning and estimation, Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture - design, different technical layers, best practices, data architecture and designs, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Communication Protocols, Policies, Deployment Strategy, Software Construction Maps, testing, rolling out.

References:

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu, “Raising Enterprise Applications”, John Wiley.
2. Dean Leffingwell, Don Widrig, “Managing Software Requirements A Use Case Approach”, Pearson Education, 2008
3. Soren Lauesen, “Professional-Software Requirements: Styles & Techniques”, Addison-Wesley

CSE 328 UNIX SYSTEM PROGRAMMING

[3 1 0 4]

UNIX system overview, UNIX and ANSI standards, standard C library functions, UNIX & POSIX APIs. File Types, file Systems and Attributes, Inodes, Directory Files, Hard and Symbolic Links, File and Record Locking, Directory, FIFO, file APIs, File Descriptors. UNIX kernel support for processes, Process Environment: Introduction, process termination, command-line arguments, Shared Libraries, Memory Allocation, Environment Variables, and functions related to allocation. Introduction to process control, Process Id, related functions. Process Relationship: Introduction, terminal and n/w logins, process groups, sessions, job control, shell execution of programs, orphaned process groups. Signals: Signal Concepts, signal Function, reliable signal terminology and semantics system functions. Inter-process communication: IPC methods and messages, semaphores, shared memory and sockets.

References:

1. Richard Stevens, "Advanced Programming in the Unix Environment" 2nd Edition, Pearson Publications
2. T Chan, "Unix System Programming Using C++" PHI Publications
3. Neil Mattew and Richard Stones, "Beginning Linux Programming" Wrox Publications

CSE 330 ADVANCED COMPUTER NETWORKS

[3 1 0 4]

Advanced Routing and Switching, Data Centers, Overview, Server Architecture, Overview, Application Architectures, Data Center Design, Security, Server Load-Balancing, Virtualization Overview, Benefits, Implementation, challenges, examples, Cloud Computing Architecture, Amazon Cloud Computing, Service Levels for Cloud Computing, Data and Network Security, Disaster Recovery Planning & Management, Wireless Networks, Wireless LAN & WAN Fundamentals, Planning and Operation, Wireless Clients, WLAN Security, WLAN infrastructure for mobility, Voice over wireless, Location Based Services, Voice Over Internet Protocol PSTN, ISDN, Role of Digital Signal Processing, Microprocessor, Network problems, IP signaling Protocol, SIP, RTP/RTCP, SDP, PSTN Numbering Plan, Dial-Peer, CISCO Voice Products

References:

1. Todd Lammle, "CCNA Cisco Certified Network Associate Study Guide", (7th Edition),
2. Mauricio Arregoces and Maurizio Portolani, "Datacenter Fundamentals", Cisco Press
3. Danielle Ruest, Nelson Ru'est, "Virtualization, A Beginner's Guide", McGrawHill 2009
4. Robert C Elsen Peter et.al, "Cloud Computing, A Practical Approach", McGrawHill

CSE 421 SOFTWARE TESTING AND ANALYSIS

[3 1 0 4]

Software Test and Analysis in a nut shell – Engineering Processes and Verification, A Framework for Test and Analysis – Validation and verification, Degrees of Freedom, Varieties of Software, Basic Techniques, Finite models, Dependence and data flow models, Inter-procedural analysis, Testcase selection and adequacy, Structural testing, comparing structural testing criteria, the infeasibility problem, Data flow testing, criteria, data flow coverage with complex structures, Model based testing, Deriving test cases from finite state machines, Testing

object Oriented software-Issues,intra class testing, testing with state machine models, interclass testing, structural testing ,Fault based testing,Test execution

References:

1. Mauro Pezze, Michal Young“Software Testing and Analysis: Process, Principles and Techniques”, John Wiley & Sons, 2008.
2. Aditya P Mathur, “Foundations of Software Testing” Pearson Education,2008.
3. Gopaldaswamy Ramesh, SrinivasanDesikan “Software testing Principles and Practices”, Pearson, 2nd Edition, 2007.
4. Ron Patton“Software Testing”, Pearson Education,2nd edition, 2004.

CSE 423 ARTIFICIAL INTELLIGENCE

[3 1 0 4]

Intelligent Systems, Foundations of AI, Applications of AI, Current trends in AI Characteristics of Problems, Problem reduction, Game playing, Bounded look-ahead strategy and use of evaluation functions, Alpha-Beta Pruning, Two – Player perfect information gamesPropositional Logic, Natural deduction system, Resolution Refutation in PL, Knowledge representation Issues, Probability Theory, Bayesian Belief Networks, Certainty Factor TheoryAgents vs software programs, Agents and its working, Single Agent and Multi-Agent systems, Performance evaluation of Agents, Architectures for Intelligent Agents. Fuzzy sets and operations, Types membership functions, Multi-valued logic and Fuzzy Logic.Machine-Learning Systems, Supervised and Unsupervised learning, Inductive learning, Deductive learning, Support Vector Machine. ANN, feed-forward networks.

References:

1. SarojKaushik, “Artificial Intelligence”, Cengage Learning Publications,First Edition(2011).
2. Don W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”,PHI Publication,2006.
3. John Yen, Reza Langari,“ Fuzzy Logic Intelligence, Control, and Information”, Pearson Education, 2004.

CSE 425 C# PROGRAMMING AND .NET CONCEPTS

[3 1 0 4]

Introduction to .NET platform, .NET base class libraries,.NET binaries, CIL, assembly manifest, documenting source code via XML, preprocessor directives, value types and reference types,Interfaces, encapsulation and polymorphism, system.systemexception, system.applicationexception, handling multiple exceptions,garbage collection, systemGC type.Defining and Invoking interface members at the object level, interface implementation, interfaces as polymorphic agents, Iconvertible interface, cloneable objects, custom enumerator, system.collections.Callback interfaces, delegate types, members of System.MulticastDelegate, events. Cross-language inheritance,building a shared assembly, installing/removing shared assemblies.

References:

1. Andrew Troelsen, "C# and the .NET Platform", Dreamtech Press India Reference, Second Edition, 2003
2. Andrew Troelsen, "Pro C# 2010 and the .NET 4 Platform", Apress publication, Fifth Edition, 2010
3. Barbara Doyle, "Programming in C#", Cengage Learning, 2011
4. Tom Archer, "Inside C#", WP Publishers, 2001

CSE 427 DEVELOPING ENTERPRISE APPLICATION USING JEE TECHNOLOGIES

[3 1 0 4]

Overview of JEE5, Enterprise architecture, JEE containers, developing JEE applications, Introduce web app, Java database programming, jdbc drivers, features, implementation, Scrollable Result Sets, Transactions, Commits, Rollbacks, Servlets, Lifecycle, RequestDispatcher, Including and forwarding, Error Handling, Basic JSP Architecture, Life Cycle of JSP, Libraries JSP Expression Language (EL) Using Custom Tag JSP Capabilities, Exception Handling, Session Management, Directives, Enterprise Bean Stateless Session Beans, Working with Entity Beans, Message Driven Beans, Struts Architecture, classes, Struts flow with an example application, Struts Tiles Framework, Other J2EE Technologies. Java Mail JTA Web Services JMS, ANT, Log4J JSF Hibernate Spring Framework Design Pattern

References:

1. Kogent Solutions, "Java Server Programming Java Ee5 Black Book(Platinum Ed)", Dreamtech Press, 2008
2. James Keogh, "The Complete Reference J2EE", Tata McGraw-Hill Publishing, 2002
3. Jain, Siddiqui, NUT, "J2EE Professional Projects", Prentice Hall of India, 2002

CSE 429 STORAGE DEVICE TECHNOLOGY

[3 1 0 4]

Introduction to Information Storage and Management, Data center infrastructure, Information Lifecycle, Storage System Environment, Data Protection, RAID, RAID levels, Intelligent Storage System, EMC CLARIION, Direct Attached Storage and Introduction to SCSI, Storage Area Networks, Network Attached Storage, Content Addressed Storage, Architecture, Examples, Storage Virtualization, Configuration, Challenges, Storage Area Networks, Zoning, Business Continuity, Information Availability, Business Impact Analysis, Backup and Recovery, Backup purpose, Considerations, Granularity, Technologies, Local Replication, Remote Replication, Concepts in practice.

References:

1. G. Somasundaram, AlokShrivastava, “Information Storage and Management- Storing, Managing, and Protecting Digital Information”, EMC Education Services, Wiley India Edition, 2009.
2. Marc Farley, “Storage Networking Fundamentals”, CISCO Systems, First edition, 2004.
3. Gupta Meena, “Storage Area Network Fundamentals”, Pearson Ed.

CSE 431 NEURAL NETWORKS AND FUZZY SYSTEMS

[3 10 4]

Characteristics of neural network, Artificial Neural Network terminology, Pattern Recognition problem, Basic Functional units, Perceptron architecture- single neuron perceptron, multiple neuron perceptron, Signal and weight vector spaces – Liner vector space, Linear transformation, matrix representations, change of basis, eigenvalues eigenvectors. Supervised Hebbian Learning -Linear associator, Hebb rule, Pseudoinverse rule, Application, Performance Surface and Optimum points –Performance Optimization – Steepest descent, Newton’s method. Widrow-Hoff learning – ADALINE network, Algorithms,Backpropagation Learning, Associative Learning –Simple recall network, Competitive networks, Crisp and Fuzzy sets, Operations and relations on Fuzzy sets

References:

1. B.Yegnanarayans, “ Artificial Neural Networks”, PHI 2010
2. M.T.Hagan, H.B.Demuth, M.Beale, “Neural network design”, Cengage Learning
3. G.J.Klir, T.A. Folger, “Fuzzy sets, uncertainty and Information”, PHI, 2010

CSE 433 DATA WAREHOUSING AND DATA MINING

[3 10 4]

Introduction to Data warehousing and Data Mining, Data preprocessing, Data cleaning, Data Integration and Transformation, Multidimensional Data model, Warehouse schema, OLAP operations, Three tier data warehousing architecture, Knowledge discovery in databases, Data mining techniques, Association rules mining, Algorithms for mining frequent patterns, From association mining to correlation analysis, Introduction to classification and prediction, Decision Tree Induction, Bayesian Classification, Rule Based Classification, Back-propagation, Lazy Learners, Prediction, Accuracy and Errors, Ensemble methods, Introduction to cluster analysis, Partitioning methods, Hierarchical methods, Outlier analysis, Trends and applications in data mining

References:

1. Jiawei Han and Micheline Kamber, “Data Mining: Concepts and Techniques”, Second Edition, Elsevier, 2006
2. H. Witten and E. Frank, ” Data Mining: Practical Machine Learning Tools and Techniques”, Morgan Kaufmann, 2000.

3. M.H.Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education 2006

CSE 435 MULTIMEDIA APPLICATIONS

[3 1 0 4]

I-Multimedia Fundamentals, Introduction, Multimedia and personalized Computing, Multimedia Systems, Communications, information representation, networks, Applications, networking Terminology. Multimedia information representation, Text and image Compression, Audio and Video Compression, Media and Time, Digital Audio signal processing, Video equipment, Multimedia Information Systems, Data models for Multimedia and hypermedia information, Multimedia Communication Systems, Multimedia Conferencing architectures, Introduction, Seams and design approaches, architecture of teamworkstation, Experimental use of teamworkstation, evaluation of overlay in remote teaching of machine operation.

References:

1. John F Koegel Buford, "Multimedia Systems", Pearson Publication, 2010.
2. Fred Halshal, "Multimedia Communications-Applications, Networks, Protocols and Standards", Pearson Publications, 2009.
3. Ralf Steinmetz and KlaraNahrstedt, "Multimedia Fundamentals- Volume 01 Media coding and content processing", Pearson Publication, 2009.

CSE 437 BUSINESS INTELLIGENCE AND ITS APPLICATION

[3 1 0 4]

Introduction to Business Intelligence, Types of digital data; Introduction to OLTP and OLAP, Evolution of BI, Applications, Components, Framework, Roles & Responsibilities, Data Warehouse, Data integration, Data quality, Data profiling and applications, Data flow and transformations, SSIS Architecture, Introduction to ETL using SSIS; Integration Services objects; Data flow components, Data and dimension modeling, multidimensional data model, Concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, Measures, Metrics, KPIs and Performance Management, Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, Introduction to SSRS Architecture, enterprise reporting using SSRS, BI Road Ahead

References:

1. David Loshin, "Business Intelligence", Morgan Kaufmann Publishers, 2003
2. Mike Biere, "Business Intelligence for the Enterprise", 2nd edition, IBM Press, 2003.
3. R N Prasad, Seema Acharya, "Fundamentals of Business Analytics", Wiley India, 2011

CSE 439 EMBEDDED SYSTEMS

[3 1 0 4]

An embedded system, Processor in the system, Hardware Units, Software Embedded into a system, Allocation of Memory to program Segments and Blocks and Memory Map of a system , DMA, Interfacing Processor, Memories and I/O Devices Device Drivers--Interrupt Servicing Mechanism-Context and Periods for Context Switching-Deadline and Interrupt Latency Programming in Assembly Language (ALP) Embedded Programming in C++, Embedded Programming in Java, 'C' Program compilers and Cross compiler, Source code Engg., Process Communication and Synchronization of Processes, Tasks and Threads- Multiple Processes in an Application, Network operating Systems, Real Time and Embedded System Operating Systems, Performance Metrics in scheduling Models for Periodic, sporadic and aperiodic tasks, Real Time Communication Protocols.

References:

1. Phillip A. Laplante, "Real Time Systems Design and Analysis", Wiley India Edition, 3rd edition, 2006.
2. Rajkamal, "Embedded Systems Architecture, Programming and Design", Tata McGraw Hill, Fifth reprint, 2005
3. C.M. Krishna & Kang G. Shin, "Real time Systems", McGraw Hill International Edition, 1997.

CSE 441 DESIGN OF UNIX OPERATING SYSTEM

[3 1 0 4]

System structure, User perspective, Operating system services, Buffer Headers, structure of the buffer pool, Scenarios for retrieval of a buffer Reading and writing disk blocks, Structure of a regular file, System calls for the file system ,Directories, Conversion of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks, Process states and transitions, Layout of system memory, SleepProcess creation, Signals, Process termination, Awaiting process termination, Invoking other programs, The user id of a process, Changing the size of process, The shell, System boot and the Init process. Process scheduling, System calls for time, ClockSwapping, Demand paging, A hybrid system with swapping and demand paging. Inter-process communication: IPC methods and messages, semaphores, shared memory and sockets.

References:

1. Maurice J. Bach, "The Design Of Unix Operating System", Prentice Hall Of India, 1988,
2. Stephen G Kochan & Patrick H Wood, "Exploring The Unix System", Cbs Publishers & Distributers, 1984.
3. Abdul Mohammad, "Unix Step By Step", Narosa Publications.
4. Karee Christian, "The Unix Operating System (Second Edition)", John Wiley & Sons, 1989.

CSE 443 SOFTWARE ARCHITECTURE

[3 1 0 4]

The Architecture Business Cycle: System quality attributes; Quality attribute scenarios in practice; Other system quality attributes; Introducing tactics; Availability tactics; Modifiability tactics; Performance tactics; Security tactics; Testability tactics; Usability tactics; Relationship of tactics to architectural patterns; Architectural patterns and styles. Pattern Categories, Relationship between Patterns, Pattern Description, Patterns and Software Architectures Introduction; from mud to structure: Layers, Pipes and Filters, Blackboard. Distributed Systems: Broker; Interactive Systems: MVC, Presentation-Abstraction Control. Adaptable Systems: Microkernel; Reflection. Structural decomposition: Whole – Part; Organization of work: Master – Slave; Access Control: Proxy. Uses of Architectural Documentation, Views, Choosing the Relevant Views, Documentation across Views

References:

1. Len Bass, Paul Clements, Rick Kazman, “Software Architecture in Practice”, Pearson Education, 2nd Edition, 2003.
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal, “Pattern-Oriented Software Architecture A System of Patterns”, Volume 1, John Wiley and Sons, 2006.
3. E. Gamma, R. Helm, R. Johnson, J. Vlissides, “Design Patterns- Elements of Reusable Object-Oriented Software”, Addison-Wesley, 1995.

CSE 445 BIO-INFORMATICS

[3 1 0 4]

Scope of Bioinformatics, Basic concepts, Central dogma of molecular biology, Overview of Genomics and Proteomics, FASTA format, Genome and proteome databases, Protein sequence databases, Information retrieval. Introduction to Perl programming, Applications of Data Mining to Bioinformatics, Bioinformatics with soft computing. Biosequence alignment, Dynamic programming, Heuristic methods. Classification of protein structures, protein structure prediction, protein folding, Computer aided drug design. Phylogenetic trees – clustering methods. Understanding microarray data, Computational analysis of microarray

Text books:

1. D. E. Krane and M. L. Raymer, “Fundamental Concepts of Bioinformatics”, Pearson Education, 2003.
2. Tisdall, J.D, “Beginning Perl for Bioinformatics”, O’Reilly & Associates, VI Indian Reprint 2007
3. DovStekel, “Microarray Bioinformatics”, Cambridge University press.

OPEN ELECTIVE

CSE 330 PRINCIPLES OF PROGRAMMING LANGUAGES

[3 0 0 3]

Programming Language –Abstractions, Computational Paradigms, Language Definition, Translation, Language design principles- History and design criteria, Efficiency, Regularity, Syntax-Lexical Structure of programming Languages, CFGs and BNFs, Parse Trees and Abstract Syntax Trees, Ambiguity, Associativity and Precedence, EBNFs and Syntax Diagrams, Attributes bindings and semantic functions, Declarations, Blocks and Scope, The Symbol Table, Name resolution and Overloading, Allocation, Lifetimes, and the Environment, Variables and Constants, Aliases, Dangling references and Garbage. Data Types, Expressions and Statements, Object Oriented Programming, Software reuse and Independence, Functional Programming, Logic Programming

References:

1. Kenneth C. Loudon “Programming Languages Principles and Practice” Thomson Brooks/Cole Publication, Second Edition.
2. Terrence W. Pratt, Masvin V. Zelkowitz “Programming Languages design and Implementation”, Pearson Education, Fourth Edition.
3. Allen Tucker, Robert Noonan “Programming Languages Principles and Paradigms Tata MC Graw –Hill Publication, Second Edition.

CSE 332 PROGRAMMING IN C++

[3 0 0 3]

Object-Oriented Programming Systems, Comparison of C++ with C, Reference Variables in C++, Function Prototyping, Function Overloading, Default Values for Formal Arguments of Functions, Inline Functions. Object oriented concepts & its applications. Base Class and Derived Class Pointers, Function Overriding, Base Class Initialization, The Protected Access Specifier, Deriving by Different Access Specifiers, Different Kinds of Inheritance, Order of Invocation of Constructors and Destructors. The Need for Virtual Functions, Virtual Functions, Streams, Operator Overloading, C-Style handling of error generating codes, C++ Style solution – the try/throw/catch construct, Limitation of exception handling.

References:

1. Sourav Sahay, “Object-Oriented Programming with C++”, Oxford University Press, 2008.
2. Balagurusamy “Object Oriented programming with C++”, 3rd Edition, 2006.
3. Stanley B. Lippman, Josee Lajoie, Barbara E. Moo, “C++ Primer”, Addison Wesley, 4th Edition, 2005.
4. Herbert Schildt, “The Complete Reference C++”, Tata McGraw Hill., 4th Edition, 2005.

CSE 334 PROGRAMMING IN JAVA

[3 0 0 3]

Object Oriented Programming, Byte Code Concept, A First Simple Java Program, Data Types, Variables and Arrays, Operators, Control Statements, Classes and Methods, Inheritance, String Handling, Packages, Interface, Exception Handling, Multithreaded Programming, File Handling: Input/Output Stream, File Input/Output Stream, Character Stream, File Reader, File Writer, Serialization, Applet Class, Event Handling: Event Class, Source Of Events, Event Listeners, Adapter Classes, Inner Classes, Introduction to AWT: Working with Windows And Graphics, Using AWT Controls, Layout Managers, Menus, Introduction to Databases: JDBC Connectivity

References:

1. Herbert Schildt , “The Complete Reference Java Seventh Edition” Tata McGraw-Hill, reprint 2007.
2. Deitel and Deitel, “Java How to Program”, Pearson Edu., 8th edition.
3. Steven Holzner, “Java 2 programming black book”, Dream Tech, NewDelhi, reprint: 2005.
4. Pratik Patel&KarlMoss , “Java database programming with JDBC” DreamTech, New Delhi, second edition, 2000

CSE 336 LINUX BASICS AND PROGRAMMING

[3 0 0 3]

Introduction to UNIX, Linux, The GNU Project and the Free Software Foundation Programming Linux. The UNIX Operating System: A brief Session in Unix/Linux, The UNIX Architecture and Command Usage. General purpose utilities and the file system: Commands like Cal, date, bc., The file, pathnames, commands, Handling unix/linux files, attributes Permissions, Changing File Ownership, Shell and programming, Shell Syntax and commands. Filters-commands, Basic and extended Expressions, The process: system process, mechanism of Process Creation and kill. Essential system administration: Linux Installation, System administration and setting LAN.

References:

1. Neil Matthew and Richard Stones “Beginning Linux Programming” Wrox Publication, 2008
2. Sumitabha Das “UNIX Concepts and Applications” TMH Publications, 2011.
3. Behrouz A Forouzan and Richard F Gilbery “UNIX and Shell Programming”, CENGAGE Learning India Edition New Delhi, 2004.

CSE 338 WEB 2.0 and RICH INTERNET APPLICATIONS

[3 0 0 3]

Introduction to Web 2.0, Software as a Service (SaaS), Data and Web 2.0, Convergence, Iterative development, Rich User experience, Multiple Delivery Channels, Social Networking. Web Services, Understanding differences between HTML and Flex applications, Understanding how Flex applications work, Working with XML Framework fundamentals, Understanding

application life cycle, Bootstrapping Flex applications, Loading one flex application in to another, Understanding application domains, Understanding the preloader. Managing layout, Working with UI components, Examples: Building an RSS reader with AJAX, Building an RSS reader with Flex.

References:

1. Thomas A. Powel, "Ajax: The Complete Reference" , McGraw Hill, 2008.
2. Gottfried Vossen, Stephan Hagemann, "Unleashing Web 2.0: From Conceptsto Creativity", Elsevier, 2007.
3. Colin Moock, "Essential Actionscript 3.0", O'Reilly Publications, 2007.

CSE 340 INFORMATION RETRIEVAL

[3 0 0 3]

Introduction; Retrieval Strategies: Vector Space Model; Probabilistic Retrieval strategies, Language Models, Inference Networks, Extended Boolean Retrieval , Fuzzy Set Retrieval, Relevance feedback; Clustering; Passage-Based Retrieval; N-Grams; Regression Analysis; Thesauri, Semantic Networks, Parsing, Inverted Files, Boolean queries, Sequential searching, Pattern matching, Structural queries, Crossing the language barrier; Cross-Language retrieval strategies, utilities, Duplicate Document Detection, historical progression, Information retrieval as a relational application, Semi-structured search using a relational schema, Multi-dimensional data model, Parallel text scanning, indexing, Clustering and classification, Large parallel systems, distributed information retrieval, Other architectures, Multimedia IR- data modeling; Query languages, Spatial access methods, A general multimedia indexing approach , Automatic picture extraction.

References:

1. David A. Grossman, OphirFrieder, "Information Retrieval Algorithms and Heuristics", Springer, 2nd Edition, 2004.
2. Ricardo Baeza-Yates, BerthierRibeiro-Neto, "Modern Information Retrieval", Pearson Education, 1999.

CSE 342 DATABASE MANAGEMENT SYSTEMS

[3 0 0 3]

Introduction, Database System Applications, Purpose of Database Systems, Database Architecture, Database Users and Administrators, Relational model, Structure of Relational Databases, Relational-Algebra Operations, Modification of the Database, Database design and the ER model, Design Process, Entity-Relationship Model, Reduction to relational schema, SQL-Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries,Views, Modification of the Database, Joined Relations,Relational database design-Features, Atomic Domains and First Normal Form, Theory,Algorithms for Functional Dependencies, Transaction Management and Recovery, Deadlock Handling, Recovery and Atomicity, Recovery algorithms, Buffer Management,Remote Backup Systems.

References:

1. Silberschatz, Korth, Sudarshan, “Database System Concepts”, McGrawHill, Sixth Edition
2. Ramez Elmasri and Shamkant Navathe, “Fundamentals of Database Systems”, Pearson Education, Fifth Edition.
3. Thomas Connolly, Carolyn Begg, “Database Systems – A Practical Approach to Design, Implementation and Management”, Pearson Education, Third Edition.

CSE 344 PRINCIPLES OF SOFTWARE ENGINEERING**[3 0 0 3]**

Introduction to Software Engineering, A Systems Approach, An Engineering Approach, Modelling the process and Lifecycle, The meaning of process, Software process models, Process Improvement model Capturing the requirements, The requirement process, Characteristics, SRS, Designing the system, Definition, Issues, Characteristics of good design, Design Reviews, Function oriented software design Coding and testing, Code review, Internal documentation, External documentation, Software faults and failures, Testing Issues, Unit testing, Integration testing, Test plan, Planning and managing the project, Tracking Progress, Project Personnel, Effort Estimation, Risk Management, The project plan.

References:

1. Shari Lawrence Pfleeger, Joanne M. Atlee “Software Engineering Theory and Practice” 4th edition Pearson 2010
2. Rajib Mall “Fundamentals of Software Engineering” 3rd edition PHI learning 2009.
3. Pankaj Jalote, “An integrated approach to Software Engineering” Springer, 3rd edition, 2005.

CSE 346 ESSENTIALS OF IT**[3 0 0 3]**

Introduction to Operating System, Computer Hardware concepts, Basic concept of multiprogramming, multitasking and multiprocessing, Memory Management & Process Management, Scheduling Algorithms, Interprocess Communication, Threads, Concurrency, Critical section, Mutual Exclusion, Deadlocks, File Management & Device Management- I/O channels, interrupts and Relational Database Management System Concepts, Introduction to Entity Relationship modeling notations, functional dependency, and basics of Normalization, Structured Query Language (SQL), DDL, DML, concept of Order By, Group By, Having clauses and Aggregate functions, Joins - Introduce the concept of independent and correlated sub queries, Views, Embedded SQL

References:

1. Sivasubramanyam Y., Deepak Ranjan Shenoy, Nagendra R Shetty and Raghavendra N., Campus Connect Foundation Program – Vol. 1, Education and Research, Infosys Technologies, 2006.
2. Hanumesh V. J., Seema Acharya, Nagendra R Shetty and Meera Gayathri Dharmalingam, Campus Connect Foundation Program – Vol. 2, Education and Research, Infosys Technologies, 2006.
3. A. Silberschatz , P.B. Galvin and G.Gagne, Operating System Principles, Wiley & Sons(Asia),Seventh edition, 2006.
4. Henry F Korth, Abraham Silberschatz and Sudarshan, “Database system concepts”, McGraw-Hill, 5th Edition,2006.

CSE 348 ESSENTIALS OF INDUSTRIAL COMPUTING

[3 0 0 3]

Objected oriented concepts, UML class diagrams, advanced concept in OOT, Object Oriented design methodology,Recent trends in OO technology,Analysis of Algorithms, space time complexities, apriori& posteriori analysis, Brute Force algorithms, Greedy Algorithms,Divide and Conquer Algorithms, Decreases and Conquer algorithms, Dynamic Programming algorithms., Code tuning techniques, SQL Tuning techniques ,User interface Design, System Development methodologies, Client server computing and Internetworking, Client server technologies,middle ware Technologies, DNS,VPN, proxy servers, firewalls, world wide web, MIME types, browsers and web servers, Application servers, Web security

References:

1. Hanumesh V. J., SeemaAcharya, Nagendra R Shetty and MeeraGayathri, Dharmalingam, “Campus Connect Foundation Program”, Vol. 2, Education and Research, Infosys Technologies, 2006.
2. Sundar K.S., Nagendra R Shetty, Sivasubramanyam Y., Sujith Samuel Mathew and SeemaAcharya, “Campus Connect Foundation Program” Vol. 3, Education and Research, Infosys Technologies, 2006.
3. Comer Douglas E, “Computer Networks and Internets”, 5th Edition, Prentice Hall, 2011.