R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. Common	**Engineering Mathematics-II**	**B.E.- 301**

Unit I

Second Order linear differential equation with variable coefficients: Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method

Unit II

Vector Calculus: Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem

Unit III

Linear and Non Linear partial differential equation of first order: Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation, charpit's method. Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation of nth order with constant coefficients. Separation of variable method for the solution of wave and heat equations

Unit IV

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function, Half range series Fourier Transform: Definition and properties of Fourier transform, Sine and Cosine transform.

Unit V

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations

References

(i) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
(ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
(iii) Advance Engineering Mathematics by D.G.Guffy
(iv) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
(v) Engineering Mathematics by S S Sastri. P.H.I.

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B.E. (Computer Science & Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Database Management Systems	CS- 302

UNIT I

Introduction And Conceptual Modeling : Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II

Relational Model : SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependencies and Normalization for Relational Databases (up to BCNF).

UNIT III

Data Storage And Query Processing : Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files – Different types of Indexes-B-Tree - B+ Tree – Query Processing.

UNIT IV

Transaction Management : Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V

Current Trends : Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.

TEXT BOOK :

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.

REFERENCES :

1. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.
3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.
4. Peter Rob and Corlos Coronel- “Database System, Design, Implementation and Management”, Thompson Learning Course Technology- Fifth edition, 2003.

DBMS LAB

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Computer Architecture	CS- 303

UNIT I

Basic Structure Of Computers

Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II

Arithmetic Unit

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III

Basic Processing Unit

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV

Memory System

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V

I/O Organization

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

TEXT BOOK :

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2002.

REFERENCES :

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6th Edition, Pearson Education, 2003.
2. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2nd Edition, Morgan Kaufmann, 2002.
3. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw Hill, 1998.

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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Operating Systems	CS- 304

UNIT I

INTRODUCTION

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter- process Communication.

UNIT II

SCHEDULING

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria– Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical- Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization– Critical regions – Monitors.

UNIT III

DEADLOCKS

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention– Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management– Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV

PAGING AND FILE SYSTEM

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames– Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V

FILE MANAGEMENT

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

TEXT BOOK :

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

REFERENCES :

1. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India Pvt. Ltd, 2003.
3. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.

Operating System

List of Experiment

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU Scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. Write a program to implement classical inter process communication problem.
7. Write a program to implement classical inter process communication problem.
8. Write a program to implement classical inter process communication problem.
9. Write a program to implement & Compare various page replacement algorithm.
10. Write a program to implement & Compare various Disk & Drum scheduling Algorithms.
11. Write a program to implement Banker’s algorithms.
12. Write a program to implement Remote Proccedure Call(RPC).
13. Write a Devices Drivers for any Device or pheriperal.

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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Value Education	CS- 305

Chapter 1

Value Education : Concepts of Values-Definition and Types of values –The need for Education in values-Challenges for Value adoption-Character development-Vision of a better world

Chapter 2

Inculcation of values : Classification of values- Personal Values-Family Values-Social Values-Spiritual values-Benefits of value adoption

Chapter3

Values for Professional excellence : Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

Chapter 4

Business ethics : Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

Chapter 5

Quality of Life : Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

Chapter 6

Exploring the self : True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

Chapter 7

Understanding Self-Esteem : Know self-esteem-Understanding the self-Components of self-esteem-**Association with self-esteem-Levels of self-esteem-Reflection exercises**

Chapter 8

Principles of living : Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present

Chapter 9

Practical Meditation Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers

Chapter 10

Exercises for Practice : Quiet reflection- Practice introversion-Being an observer-Stand back and observe -Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon

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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Computer Programming Laboratory	CS- 306

Software Lab-I

LIST OF EXPERIMENTS PROGRAMMING IN C:

To write a C program to prepare the electricity bill.

*** Functions :**

(a) Call by value (b) Call by reference.

To write a C program to print the Fibonacci series for the given number.

To write a C program to find the factorial of number using recursion.

To write a C program to implement the basic arithmetic operations using Switch Case

Statement

To write a C program to check whether the given number is an Armstrong number.

To write a C program to check whether the given string is a Palindrome.

To write a C program to create students details using Structures.

To write a C program to demonstrate the Command Line Arguments.

To write a C program to implement the Random Access in Files.

To write C programs to solve some of the Engineering applications.

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. Common	**Engineering Mathematics-III**	**B.E.- 401**

Unit I

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit II

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equatins by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods

Unit III

Functions of complex variables : Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem , Application of Residues theorem for evaluation of real integrals

Unit IV

Solution of Ordinary Differential Equations(Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method

Reference:

(i) Numerical Methods using Matlab by J.H.Mathews and K.D.Fink, P.H.I.
(ii) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(iii) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(iv) Numerical Methods using Matlab by Yang,Wiley India
(v) Pobability and Statistics by Ravichandran ,Wiley India
(vi) Mathematical Statistics by George R., Springer

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Design And Analysis Of Algorithms	CS- 402

UNIT I

BASIC CONCEPTS OF ALGORITHMS

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II

MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm– Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT III

ANALYSIS OF SORTING AND SEARCHING ALGORITHMS

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching– Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort – Depth first Search and Breadth First Search.

UNIT IV

ALGORITHMIC TECHNIQUES

Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees– Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman trees.

UNIT V

ALGORITHM DESIGN METHODS

Backtracking – n-Queen's Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

TEXT BOOK :

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

REFERENCES :

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt.Ltd., 2001
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis",

Pearson Education Asia, 2003.

3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, “The Design and Analysis of Computer Algorithms”, Pearson Education Asia, 2003.

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Software Engineering	CS- 403

UNIT I

SOFTWARE PROCESS

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II

SOFTWARE REQUIREMENTS

Functional and non-functional - user – system –requirement engineering process – feasibility studies– requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III

DESIGN CONCEPTS AND PRINCIPLES

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems- Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT IV

TESTING

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms– regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT V

SOFTWARE PROJECT MANAGEMENT

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

TEXT BOOK :

1. Roger S. Pressman, Software engineering- A practitioner’s Approach, McGraw-Hill International

Edition, 5th edition, 2001.

REFERENCES :

1. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. James F Peters and Witold Pedryez, “Software Engineering – An Engineering Approach”, John Wiley and Sons, New Delhi, 2000.

Practical and Lab work

Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, Net Beans, and Visual Studio can be used.

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Theory Of Computation	CS- 404

UNIT I

AUTOMATA

Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.

UNIT II

REGULAR EXPRESSIONS AND LANGUAGES

Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

UNIT III

CONTEXT-FREE GRAMMAR AND LANGUAGES

Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.

UNIT IV

PROPERTIES OF CONTEXT-FREE LANGUAGES

Normal forms for CFG – Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines– Programming Techniques for TM.

UNIT V

UNDECIDABILITY

A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine – Post's Correspondence Problem - The classes P and NP.

TEXT BOOK :

1. J.E.Hopcroft, R.Motwani and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2003.

REFERENCES :

1. H.R.Lewis and C.H.Papadimitriou, "Elements of The theory of Computation", Second Edition, Pearson Education/PHI, 2003
2. J.Martin, "Introduction to Languages and the Theory of Computation", Third Edition, TMH, 2003.
3. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Computer Networks	CS- 405

UNIT I

DATA COMMUNICATIONS

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II

DATA LINK LAYER

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III

NETWORK LAYER

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting– Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV

TRANSPORT LAYER

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V

APPLICATION LAYER

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

TEXT BOOK :

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.

REFERENCES :

1. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
2. Larry L.Peterson and Peter S. Davie, “Computer Networks”, Harcourt Asia Pvt. Ltd., Second Edition.
3. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
4. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.
5. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.

NETWORKING LAB

LIST OF EXPERIMENTS

All the programs are to be written using C)

1. Simulation of ARP / RARP.
2. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
3. Develop an application for transferring files over RS232.
4. Simulation of Sliding-Window protocol.
5. Simulation of BGP / OSPF routing protocol.
6. Develop a Client – Server application for chat.
7. Develop a Client that contacts a given DNS Server to resolve a given host name.
8. Write a Client to download a file from a HTTP Server.
9. Study of Network Simulators like NS2/Glomosim / OPNET

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Unix/Linux	CS- 406

Software Lab-II

Overview of Unix/Linux: -
Concepts, Unix/Linux Installation Process, Hardware Requirements for Unix/Linux ,Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix Operating System, Features of Linux/Unix Operating System, Kernel, Kernel Functions,The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and break Statements, Sleep Command,Debugging Script. Use of Linux as web-server, file server, directory server, application server, DNS server, SMTP server, Firewall, Proxy server.

File System: -
Definition of File System, Defining Geometry, Disk Controller, Solaris File System, Disk Based File Systems, Network-Based File Systems, Virtual File systems, UFS File System, The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

Process Control: -
Viewing a Process, Command to display Process, Process Attributes, Process States,Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling riorities, Changing the Priority of a time-sharing process, Killing Process.

System Security: -
Physical Security, Controlling System Access, Restricted Shells Controlling File Access, File Access Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCP Wrappers.

Dynamic Host Configuration Protocol: -
Introduction, DHCP Leased Time, DHCP Scopes, DHCP IP Address, Allocation Types,Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCP Server, Configuration of DHCP Clients, Manually Configuring the DHCP.

Case Study: -
Installation of Linux, Customization of Linux, Installation of SAMBA, APACHE,TOMCAT, Send MAIL, Postfix, Implementation of DNS, LDAP services, Firewall, Proxy server

Suggested Reading:
1. Venkatesh Murthy, “Introduction to Unix &Shell”, Pearson Edu
2. Forouzan, “Unix &Shell Programming”, Cengage Learning
3. Sumitab Das,”Unix Concept & Application”,TMH
4. Gopalan, Shivaselvan,”Beginners Guide to Unix ” PHI Learning

List of Experiments:-

1. To Study basic & User status Unix/Linux Commands.
2. Study & use of commands for performing arithmetic operations with Unix/Linux.
3. Create a file called wlcc.txt with some lines and display how many lines, words and characters are present in that file.
4. Append ten more simple lines to the wlcc.txt file created above and split the appended file into 3 parts. What will be the names of these split files? Display the contents of each of these files.How many lines will be there on the last file?
5. Given two files each of which contains names of students. Create a program to display only those names that are found on both the files.
6. Create a program to find out the inode number of any desired file.
7. Study & use of the Command for changing file permissions.
8. Write a pipeline of commands, which displays on the monitor as well as saves the information about the number of users using the system at present on a file called usere.ux.

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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Data Structures	CS- 501

UNIT I

PROBLEM SOLVING

Problem solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample algorithms.

UNIT II

LISTS, STACKS AND QUEUES

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT III

TREES

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap

UNIT IV

SORTING

Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting

UNIT V

GRAPHS

Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP-Completeness.

TEXT BOOKS :

1. R. G. Dromey, "How to Solve it by Computer", Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed, Pearson Education Asia, 2002.

REFERENCES :

1. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education Asia, 2004
2. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", Thomson Brooks / COLE, 1998.
3. Aho, J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", Pearson education Asia, 1983.

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B.E. (Computer Science & Engineering)

THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Micro Processor And Micro Controllers	CS- 502

UNIT I

8086 PROCESSOR

Functional block diagram - Signals – Memory interfacing – I/O ports and data transfer concepts – Timing Diagram – Interrupt structure – Multiprocessor configurations.

UNIT II

PROGRAMMING OF 8086 PROCESSOR

Instruction format and addressing modes – Assembly language format – Data transfer, data manipulation, control and string instructions – Programming: Loop structure with counting & Indexing - Look up table - Subroutine instructions stack.

UNIT III

PERIPHERAL INTERFACING

Study of Architecture and programming of ICs: 8255 PPI, 8259 PIC, 8257 DMA 8251 USART, 8279 Key board display controller and 8253 Timer/ Counter – Interfacing with 8085 - A/D and D/A converter interfacing.

UNIT IV

MICRO CONTROLLER 8051

Functional block diagram - Instruction format and addressing modes – Interrupt structure – Timer –I/O ports – Serial communication.

UNIT V

MICRO CONTROLLER PROGRAMMING & APPLICATIONS

Data Transfer, Manipulation, Control & I/O instructions – Simple programming exercises, PID control algorithm – wave form generation: - square triangular and sine, key board and display interface – Closed loop control of servo motor- stepper motor control.

TEXT BOOKS :

1. A K Ray and K M Burchandi “Advanced Microprocessor and Peripherals” Tata McGraw Hill – 2004
2. Muhammad Ali Mazidi & Janice Gilli Mazidi, ‘The 8051 Micro Controller and Embedded Systems’, Pearson Education, 5th Indian reprint, 2003.

REFERENCES :

1. William Kleitz, 'Microprocessor and Micro Controller Fundamental of 8085 and 8051 Hardware and Software', Pearson Education, 1998.
2. Programming and Customizing the 8051 Microcontroller

MICROPROCESSOR LAB

LIST OF EXPERIMENTS

16-bit Microprocessor

1. Simple arithmetic operations:
2. Multi precision addition / subtraction / multiplication / division.
3. Programming with control instructions: Increment / Decrement. Ascending / scending order. Maximum / Minimum of numbers. Rotate instructions. String Manipulations Hex / ASCII / BCD code conversions.
4. Interface Experiments: A/D Interfacing, D/A Interfacing, Traffic light controller. Interface Experiments:
5. Simple experiments using 8251, 8279, 8254,8257,8259
6. Programming practice on assembler and simulator tools. 8-bit Micro controller
7. Demonstration of basic instructions with 8051 Micro controller execution, including: Conditional jumps, looping, Calling subroutines. Stack parameter testing
8. Parallel port programming with 8051 using port 1 facility: Stepper motor and D / A converter.
9. Programming Exercise on RAM direct addressing Bit addressing
10. Programming practice using simulation tools and C – compiler Initialize timer Enable interrupts.
11. Study of micro controllers with flash memory.

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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	System Programming And Operating System	CS- 503

Unit I

Introduction Language Processors, Language Processing Activities and Language Processors Development Tools, Assemblers, Compiler, Macros and Macro Processors, Linkers, Software Tools . Introduction to Operating Systems, Types of operating Systems, system protection, Operating system services.

Unit II

Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, interprocess communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization,

Unit III

Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling. Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best-Fit, First-Fit and Worst Fit Allocation, paging, segmentation, and paging combined with segmentation.

Unit IV

Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation, Role of Operating System in Security, Security Breaches, System Protection, and Password Managment.

Unit V

Disk scheduling, file concepts, File manager, File organization, access methods, allocation methods, free space managements, directory systems, file protection, file organization & access mechanism, file sharing implement issue, File Management in Linux, introduction to distributed systems.

References:

1. M. Flynn " Operating Systems". Cengage Learning.
2. Silberschatz ,"Operating system", Willey Pub
3. Tanenbaum " Modern Operating System" PHI Learning.
4. Dhamdhere, "System Programming and Operating System",TMH.
5. Stuart,"Operating System Principles, Design & Applications",Cengage Learning
6. Operating System : Principle and Design by Pabitra Pal Choudhury, PHI Learning

List of Experiment

1. Program to implement FCFS CPU scheduling algorithm.
2. Program to implement SJF CPU scheduling algorithm.
3. Program to implement Priority CPU Scheduling algorithm.
4. Program to implement Round Robin CPU scheduling algorithm.
5. Program to implement classical inter process communication problem (producer consumer).
6. Program to implement classical inter process communication problem (Reader Writers).
7. Program to implement classical inter process communication problem (Dining Philosophers).
8. Program to implement FIFO page replacement algorithm.
9. Program to implement LRU page replacement algorithm
10. Program to implement LFU page replacement.
11. Program to implement Optimal page replacement.

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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Information Storage And Management	CS- 504

Unit-I

Introduction to Storage Technology: Data proliferation, evolution of various storage technologies,Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Unit-II

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-III

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Unit –IV

Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

Unit-V

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

References:

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.

5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.

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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Object Oriented Programming using C++	CS- 505

UNIT I

Principles of OOP, procedure oriented programming vs. object oriented programming, basic concepts, advantages, application of OOPs, object oriented languages. Beginning with C++: structure of C++ program, creating, compiling, linking & executing a C++ program, Tokens, expressions & control structures, keywords, identifiers, basic data types, user-defined data types,derived data types, symbolic constants, type compatibility, variable declaration, dynamic initialization of variables, reference variables,operators in C++.

UNIT II

Scope resolution operator, memory management operators, manipulators, type cast operators, operator precedence, control structures.Main function , function prototyping, call by reference, call by value,inline functions, default arguments, constant arguments, function overloading.Introduction to constructors and destructors, operator overloading & type conversions.

UNIT III

Specifying a class, defining member functions, making an outside function inline, private member function; array within a class, memory allocation for objects , static data members, static member functions, array of objects,objects as function arguments, returning objects.

UNIT IV

Friend functions, Inheritance and its various types along with programs, introduction to pointers, pointers to object, pointers to derived classes, virtual functions and polymorphism, this pointer.

UNIT V

Managing console I/O operations: introduction, C++ streams, C++ stream classes, unformatted I/O operations, formatted console I/O operations, managing O/P with manipulators. Working with Sequential Date Files: Introduction, opening & closing a file, detecting EOF, sequential input & output operations.

TEXT BOOK:

1. Object oriented programming with c++ by E. Balaguruswamy.

REFERENCES :

1. Programming in C++ by Robert Lafore
2. C++ - The complete reference by Herbert Schildt (TMH)
3. Programming with C++ - Schaum Series

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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	C# & .Net Framework	CS- 506

UNIT I

INTRODUCTION TO C#

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II

OBJECT ORIENTED ASPECTS OF C#

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III

APPLICATION DEVELOPMENT ON .NET

Building Windows Applications, Accessing Data with ADO.NET.

UNIT IV

WEB BASED APPLICATION DEVELOPMENT ON .NET

Programming Web Applications with Web Forms, Programming Web Services.

UNIT V

THE CLR AND THE .NET FRAMEWORK

Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.

TEXT BOOK :

1. J. Liberty, “Programming C#”, 2nd ed., O’Reilly, 2002.

REFERENCES :

1. Herbert Schildt, “The Complete Reference: C#”, Tata McGraw-Hill, 2004.
2. Robinson et al, “Professional C#”, 2nd ed., Wrox Press, 2002.
3. Andrew Troelsen, “C# and the .NET Platform”, A! Press, 2003.
4. S. Thamarai Selvi, R. Murugesan, “A Textbook on C#”, Pearson Education, 2003

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THIRD YEAR

Semester – VI

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Computer Graphics And Multimedia	CS- 601

UNIT I

OUTPUT PRIMITIVES

Introduction - Line - Curve and Ellipse Drawing Algorithms – Attributes – Two-Dimensional Geometric Transformations – Two-Dimensional Clipping and Viewing.

UNIT II

THREE-DIMENSIONAL CONCEPTS

Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation.

UNIT III

MULTIMEDIA SYSTEMS DESIGN

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

UNIT IV

MULTIMEDIA FILE HANDLING

Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval Technologies.

UNIT V

HYPERMEDIA

Multimedia Authoring & User Interface – Hypermedia messaging - Mobile Messaging – Hypermedia message component – Creating Hypermedia message – Integrated multimedia message standards – Integrated Document management – Distributed Multimedia Systems.

TEXT BOOKS :

1. Donald Hearn and M.Pauline Baker, “Computer Graphics C Version”, Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, “Multimedia Systems and Design”, PHI, 2003

REFERENCES :

1. Judith Jeffcoate, “Multimedia in practice technology and Applications”, PHI, 1998.
2. Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles & Practice”, Pearson Education, second edition 2003.

COMPUTER GRAPHICS AND MULTIMEDIA LAB

LIST OF EXPERIMENTS

1. To implement Bresenham's algorithms for line, circle and ellipse drawing
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing.
3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To visualize projections of 3D images.
6. To convert between color models.
7. To implement text compression algorithm
8. To implement image compression algorithm
9. To perform animation using any Animation software
10. To perform basic operations on image using any image editing software

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THIRD YEAR

Semester – VI

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Java Programming	CS- 602

Java Fundamentals

Features of Java ,OOPs concepts ,Java virtual machine ,Reflection byte codes ,Byte code interpretation, Data types, variable, arrays, expressions, operators and control structures, Objects and classes.

Java Classes

Abstract classes ,Static classes ,Inner classes ,Packages ,Wrapper classes ,Interfaces Access control. Exception handling , Exception as objects , Exception hierarchy, Try catch finally ,Throw, throws.

IO package

Input streams , Output streams ,Object serialization , Deserialization ,Sample programs on IO files, Filter and pipe streams .Multi threading ,Thread Life cycle ,Multi threading advantages and issues, Simple thread program Thread synchronization .

GUI

Introduction to AWT programming ,Layout and component managers ,Event handling , Applet class, Applet life-cycle ,Passing parameters embedding in HTML ,Swing components – JApplet, JButton JFrame, etc. Sample swing programs .

Database Connectivity

JDBC architecture ,Establishing connectivity and working with connection interface , Working with statements

References:

1. Programming with Java A Primer, E.Balaguruswamy Tata McGraw Hill Companies
2. Java Programming John P. Flynt Thomson 2nd
3. Java Programming Language Ken Arnold Pearson
4. The complete reference JAVA2, Herbert schildt. TMH
5. Big Java, Cay Horstmann 2nd edition, Wiley India Edition
6. Core Java, Dietel and Dietel
7. Java – Balaguruswamy
8. Java server programming, Ivan Bayross SPD

JAVA PROGRAMMING LAB

1. Programs using constructor and destructor
2. Creation of classes and use of different types of functions
3. Count the number of objects created for a class using static member function
4. Write programs on interfaces
5. Write programs on packages
6. Write programs using function overloading
7. Programs using inheritance
8. Programs using IO streams
9. Programs using files
10. Write a program using exception handling mechanism
11. Programs using AWT
12. Programs on swing
13. Programs using JDBC

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Distributed Computing	CS- 701

UNIT I

INTRODUCTION

Introduction to distributed computing system - Hardware concepts - switched multiprocessor - Bus based multicomputers - switched multicomputers - software concepts - Network operating systems- Time distributed systems. Design Issues: Transparency - Flexibility - Reliability - Performance and scalability.

UNIT II

RPC

RPC - Communications in distributed systems - The client/ server model - Implementation – RPC model - Implementing RPC mechanism - communication protocols for RPCs - exception handling- special types of RPC - Stub generation - Client - server binding - exception handling - RPC in heterogeneous environments.

UNIT III

SYNCHRONIZATION AND DISTRIBUTED SHARED MEMORY

General architecture of Distributed shared memory - Design and implementation issues of DSM - Granularity - Thrashing- structure of shared memory space - Advantages of DSM - synchronization in distributed systems - Clock synchronization - mutual exclusion - election algorithms - Atomic transactions - Deadlock distributed system- Threads - Thread usage and implementation of thread packages - processor allocation.

UNIT IV

DISTRIBUTED FILE SYSTEM

File service interface - semantics of file sharing - Distributed file system - Implementation of new trends in distributed file system.

UNIT V

DISTRIBUTED DATABASES

Distributed DBMS architecture - sorting data in a distributed DBMS - Distributed catalog management- distributed query processing - updating distributed data - distributed transaction management - distributed concurrency control - Recovery.

TEXT BOOKS :

1. Andrew S. Tannenbaum - "Modern operating systems" - Prentice Hall - 1995
2. Raghu Ramakrishnan - "Data base management systems" - McGraw Hill - 1998

REFERENCES :

1. G. R. Andrews, "Distributed systems". 2000
2. Pradeep K. Sinha, "Distributed operating system", 5th edition, PHI, 2002.
3. Sape Mullender, "Distributed systems", Addison - Wesley, 1993.
4. Mukesh Singal and Shivaratu N. G., "Advanced Concepts in Operating Systems", McGraw Hill, Newyork 1994.

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Soft Computing	CS- 702

UNIT I

FUZZY SET THEORY

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology– Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning –Fuzzy Inference Systems – Input Space Partitioning and Fuzzy Modeling.

UNIT II

OPTIMIZATION

Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III

NEURAL NETWORKS

Supervised Learning Neural Networks – Perceptrons - Adaline – Backpropagation Mutilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT IV

NEURO FUZZY MODELING AND OTHER TECHNIQUES

Adaptive Neuro-Fuzzy Inference Systems – Architecture – Support Vector Machines – Independent Component Analysis.

UNIT V

APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TEXT BOOK :

1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.

REFERENCES :

1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
2. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.

4. R.Eberhart, P.Simpson and R.Dobbins, “Computational Intelligence - PC Tools”, AP Professional, Boston, 1996.

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Web Technology	CS- 703

UNIT I

INTRODUCTION

Introduction – Network concepts – Web concepts – Internet addresses - Retrieving Data with URL– HTML – DHTML: Cascading Style Sheets - Scripting Languages: Javascript – Vbscript.

UNIT II

COMMON GATEWAY INTERFACE

Common Gateway Interface: Programming CGI Scripts – HTML Forms – Custom Database Query Scripts – Server Side Includes – Server security issues – XML.

UNIT III

JAVA PROGRAMMING

Java fundamentals: Classes – Inheritance – Packages – Interfaces – Exceptions Handling – Multi threading – Applets.

UNIT IV

SERVER SIDE PROGRAMMING

Server side Programming – Active server pages – Java server pages – Java Servlets: Servlet container – Exceptions – Sessions and Session Tracking – Using Servlet context – Dynamic Content Generation – Servlet Chaining and Communications.

UNIT V

APPLICATIONS

Simple applications – Internet Commerce – Database connectivity – Online databases – EDI Applications in Business – Plug-ins – Firewalls.

TEXT BOOKS:

1. Deitel, Deitel and Neito, “INTERNET and WORLD WIDE WEB – How to program”, Pearson education Asia, 2001
2. D.Norton and H. Schildt, “Java 2: The complete Reference”, TMH, 2000.
3. Elliotte Rusty Herold, “Java Network Programming”, O’Reilly Publications, 3rd Edition, 2004.

REFERENCES :

1. Eric Ladd and Jim O’Donnell, et al, “USING HTML 4, XML, and JAVA1.2”, PHI publications, 2003.
2. Jeffy Dwight, Michael Erwin and Robert Nikes “USING CGI”, PHI Publications, 1997

WEB TECHNOLOGY LAB

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box.
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with matrix of buttons
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select Foreground or background use check box control as radio buttons
   - To set background images
4. Write programs in Java to do the following.
   - Set the URL of another server.
   - Download the homepage of the server.
   - Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
   - HTTP request
   - FTP
   - SMTP
   - POP3
6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.
7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

9. Create a web page with the following using HTML
   i) To embed a map in a web page
   ii) To fix the hot spots in that map
   iii) Show all the related information when the hot spots are clicked.

10. Create a web page with the following.
    i) Cascading style sheets.
    ii) Embedded style sheets.
    iii) Inline style sheets.

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FOURTH YEAR

Semester – VII

Electives - I

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Free Open Source Software	CS - 7041

UNIT I

OVERVIEW

Overview of Free/Open Source Software-- Definition of FOSS - GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential, global and Indian. GNU/Linux OS installation-- detect hardware, configure disk partitions - file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files - log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

UNIT II

Configuring additional hardware - sound cards, displays - display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities-- configure X windows, detect display devices ; Installing software - from source code as well as using binary packages.

Setting up email servers-- using postfix (SMTP services), courier (IMAP POP3 services), squirrel mail (web mail services) ; Setting up web servers -- using apache (HTTP services), php (server- side scripting), perl (CGI support) ; Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squid (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database)

UNIT III

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection -GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools -- using CVS to manage source code revisions, patch diff.

UNIT IV

Understanding the GNU Libc libraries and linker -- linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting. Basics of the X Windows server architecture.

UNIT V

Qt Programming; Gtk+ Programming; Python Programming; Programming GUI applications with localisation support.

TEXT BOOK :

1. N. B. Venkateshwarlu, Introduction to Linux: Installation and Programming (Ed); B S Publishers; 2005. (An NRCFOSS Publication)

REFERENCES :

1. Matt Welsh, Matthias Kalle Dalheimer, Running Linux, Fifth Edition, O'Reilly Publishers, December 2005, ISBN: 0-596-00760-4.
2. Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, November 2004, ISBN: 0-596-00640-3.
3. Joshua Gay (Editor), Free Software, Free Society: Selected Essays of Richard M. Stallman, First Edition, GNU Press, October 2002, ISBN: 1-882114-98-1. (Downloadable version: http:// www.gnupress.org/philosophy/fsfs/rms-essays.pdf)
4. Learning the bash Shell, 3rd Edition, O'Reilly, 2005. URL: http://www.oreilly.com/catalog/ bash3/index.html Note: This book is very well written. It deals with shell scripting as a natural part of the learning the shell. I'd recommend this over the ABS Guide.

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	PARALLEL COMPUTING	CS - 7042

UNIT I

SCALABILITY AND CLUSTERING

Evolution of Computer Architecture – Dimensions of Scalability – Parallel Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview– Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel Programs.

UNIT II

ENABLING TECHNOLOGIES

System Development Trends – Principles of Processor Design – Microprocessor Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding.

UNIT III

SYSTEM INTERCONNECTS

Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT IV

PARALLEL PROGRAMMING

Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT V

MESSAGE PASSING PROGRAMMING

Message Passing Paradigm – Message Passing Interface – Parallel Virtual Machine.

TEXT BOOK :

1. Kai Hwang and Zhi.Wei Xu, “Scalable Parallel Computing”, Tata McGraw-Hill, New Delhi, 2003.

REFERENCES :

1. David E. Culler & Jaswinder Pal Singh, “Parallel Computing Architecture: A Hardware/Software Approach”, Morgan Kaufman Publishers, 1999.
2. Michael J. Quinn, “Parallel Programming in C with MPI & OpenMP”, Tata McGraw-Hill, New Delhi, 2003.
3. Kai Hwang, “Advanced Computer Architecture” Tata McGraw-Hill, New Delhi, 2003.

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Cryptography And Network Security	CS - 7043

UNIT I

INTRODUCTION

OSI Security Architecture - Classical Encryption techniques – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption Function – Traffic Confidentiality

UNIT II

PUBLIC KEY CRYPTOGRAPHY

Key Management - Diffie-Hellman key Exchange – Elliptic Curve Architecture and Cryptography- Introduction to Number Theory – Confidentiality using Symmetric Encryption – Public Key Cryptography and RSA.

UNIT III

AUTHENTICATION AND HASH FUNCTION

Authentication requirements – Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm - Secure Hash Algorithm – RIPEMD – HMAC Digital Signatures – Authentication Protocols – Digital Signature Standard

UNIT IV

NETWORK SECURITY

Authentication Applications: Kerberos – X.509 Authentication Service – Electronic Mail Security – PGP – S/MIME - IP Security – Web Security.

UNIT V

SYSTEM LEVEL

Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

TEXT BOOK :

1. William Stallings, “Cryptography And Network Security – Principles and Practices”, Prentice Hall of India, Third Edition, 2003.

REFERENCES :

1. Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2003.
2. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001.
3. Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition, Pearson Education, 2003.

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FOURTH YEAR

Semester – VII

Electives - II

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Nano Technology	CS - 7051

UNIT I

Electronic states in crystal energy bands, Concepts of 2D nano structures (quantum wells), 1 D nanostructures (quantum wires) OD nanostructures (quantum dots), artificial atomic clusters.

UNIT II

Size dependent properties, Size dependent absorption spectra, Blue shift with smaller sizes, Phonons in nanostructures, Contacts at Nano level, AFM.lSTM tip on a surface.

UNIT III

Charging of quantum dots, Coulomb blockade, Quantum mechanical treatment of quantum wells, wires and dots, Widening of bandgap in quantum dots, Strong and weak confinement, Properties of coupled quantum dots, Optical scattering from Nan defects,

UNIT IV

Nanocomposites Electronic and atomic structure of aggregates and nanoparticles Theory and modeling of nanoparticles fictionalization processes.

UNIT V

Nanosystems: Synthesis and chacterization Methods of Synthesis: Molecular beam epitaxy, MOCVD, chemical routes, nanoparticles on polymers, pulsed laser deposition, ion beam assisted techniques including embedded nanoparticles, RF sputtering.

TEXT BOOKS :

1. K.Bamam and D.Vvedensky, Low Dimensional Semiconductor Structures, (Cambrige University Book) 2001
2. L.Banyai and S.W.Koch, Semiconductor Quantum Dots, (World Scientific) 1993
3. http://www.nanotec.org.uklworkshop.october03health.htm(for health and safety aspects of nanostructures)
4. J.H. Davies, An introduction to the physics-af low dimensional semiconductors, Cambridge Press, 1998.
5. Karl Goser, Peter Glosekotter, Jan Dienstuhl., Nanoelectronics and Nanosystems , Springer, 2004.

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B.E. (Computer Science & Engineering)

FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Adhoc Network	CS - 7052

UNIT I

INTRODUCTION

Introduction-Fundamentals of Wireless Communication Technology - The Electromagnetic Spectrum- Radio Propagation Mechanisms - Characteristics of the Wireless Channel - IEEE 802.11a,b Standard – Origin Of Ad hoc: Packet Radio Networks - Technical Challenges - Architecture of PRNETs - Components of Packet Radios – Ad hoc Wireless Networks -What Is an Ad Hoc Network? Heterogeneity in Mobile Devices - Wireless Sensor Networks - Traffic Profiles - Types of Ad hoc Mobile Communications - Types of Mobile Host Movements - Challenges Facing Ad Hoc Mobile Networks-Ad hoc wireless Internet

UNIT II

AD HOC ROUTING PROTOCOLS

Introduction - Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks - Classifications of Routing Protocols -Table-Driven Routing Protocols - Destination Sequenced Distance Vector (DSDV) - Wireless Routing Protocol (WRP) - Cluster Switch Gateway Routing (CSGR) - Source- Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV) - Dynamic Source Routing (DSR) -Temporally Ordered Routing Algorithm (TORA) - Signal Stability Routing (SSR) -Location-Aided Routing (LAR) - Power-Aware Routing (PAR) - Zone Routing Protocol (ZRP)

UNIT III

MULTICASTROUTING IN AD HOC NETWORKS

Introduction - Issues in Designing a Multicast Routing Protocol - Operation of Multicast Routing Protocols - An Architecture Reference Model for Multicast Routing Protocols -Classifications of Multicast Routing Protocols - Tree-Based Multicast Routing Protocols- Mesh-Based Multicast Routing Protocols - Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting- Multicasting with Quality of Service Guarantees - Application-Dependent Multicast Routing - Comparisons of Multicast Routing Protocols

UNIT IV

TRANSPORT LAYER, SECURITY PROTOCOLS

Introduction - Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks - Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks -Classification of Transport Layer Solutions - TCP Over Ad Hoc Wireless Networks -Other Transport Layer Protocols for Ad Hoc Wireless Networks - Security in Ad Hoc Wireless Networks - Network Security Requirements- Issues and Challenges in Security Provisioning - Network Security Attacks - Key Management - Secure Routing in Ad Hoc Wireless Networks

UNIT V

QoS AND ENERGY MANAGEMENT

Introduction - Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks -Classifications of QoS Solutions - MAC Layer Solutions - Network Layer Solutions - QoS Frameworks for Ad Hoc Wireless

Networks Energy Management in Ad Hoc Wireless Networks –Introduction - Need for Energy Management in Ad Hoc Wireless Networks - Classification of Energy Management Schemes - Battery Management Schemes - Transmission Power Management Schemes - System Power Management Schemes.

TEXT BOOKS :

1. C. Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks: Architectures and Protocols”, Prentice Hall PTR,2004
2. C.K. Toh, Ad Hoc Mobile Wireless Networks: Protocols and Systems, Prentice Hall PTR, 2001
3. Charles E. Perkins, Ad Hoc Networking, Addison Wesley, 2000.

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Tcp/Ip Design & Implementation	CS - 7053

UNIT I

INTRODUCTION

Internetworking concepts and architectural model- classful Internet address – CIDR-Subnetting and Supernetting –ARP- RARP- IP – IP Routing –ICMP – Ipv6

UNIT II

TCP

Services – header – connection establishment and termination- interactive data flow- bulk data flow- timeout and retransmission – persist timer - keepalive timer- futures and performance

UNIT III

IP IMPLEMENTATION

IP global software organization – routing table- routing algorithms-fragmentation and reassembly- error processing (ICMP) –Multicast Processing (IGMP)

UNIT IV

TCP IMPLEMENTATION I

Data structure and input processing – transmission control blocks- segment format- comparison- finite state machine implementation-Output processing- mutual exclusion-computing the TCP data length

UNIT V

TCP IMPLEMENTATION II

Timers-events and messages- timer process- deleting and inserting timer event- flow control and adaptive retransmission-congestion avoidance and control – urgent data processing and push function.

TEXT BOOKS :

1. Douglas E.Comer – “Internetworking with TCP/IP Principles, Protocols and Architecture”, Vol. 1 & 2 fourth edition, Pearson Education Asia, 2003
2. W.Richard Stevens “TCP/IP illustrated” Volume 1 Pearson Education, 2003

REFERENCES :

1. Forouzan, TCP/IP protocol suite, 2nd edition, TMH, 2003
2. W.Richard Stevens “TCP/IP illustrated” Volume 2 Pearson Education 2003.

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FOURTH YEAR

Semester – VIII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Object Oriented Analysis And Design	CS - 801

UNIT I

INTRODUCTION

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented SystemsDevelopment Life Cycle.

UNIT II

OBJECT ORIENTED METHODOLOGIES

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns – Frameworks Unified Approach – Unified Modeling Language – Use case - class diagram - Interactive Diagram Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

UNIT III

OBJECT ORIENTED ANALYSIS

Identifying use cases - Object Analysis - Classification – Identifying Object relationships – Attributes and Methods.

UNIT IV

OBJECT ORIENTED DESIGN

Design axioms - Designing Classes – Access Layer - Object Storage - Object Interoperability.

UNIT V

SOFTWARE QUALITY AND USABILITY

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction

TEXT BOOKS:

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999
2. Martin Fowler, “UML Distilled”, Second Edition, PHI/Pearson Education, 2002.

REFERENCES :

1. Stephen R. Schach, “Introduction to Object Oriented Analysis and Design”, Tata McGraw-Hill, 2003.
2. James Rumbaugh, Ivar Jacobson, Grady Booch “The Unified Modeling Language Reference Manual”, Addison Wesley, 1999.
3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, “UML Toolkit”, OMG Press Wiley Publishing Inc., 2004.

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FOURTH YEAR

Semester – VIII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Data Warehousing And Data Mining	CS - 802

UNIT I

INTRODUCTION AND DATA WAREHOUSING

Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT II

DATA PREPROCESSING, LANGUAGE, ARCHITECTURES, CONCEPT DESCRIPTION

Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT III

ASSOCIATION RULES

Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

UNIT IV

CLASSIFICATION AND CLUSTERING

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis.

UNIT V

RECENT TRENDS

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining.

TEXT BOOK :

1. J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2001.

REFERENCES :

1. Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education 2004.
2. Sam Anahory, Dennis Murry, “Data Warehousing in the real world”, Pearson Education 2003.
3. David Hand, Heikki Manila, Padhraic Symth, “Principles of Data Mining”, PHI 2004.
4. W.H.Inmon, “Building the Data Warehouse”, 3rd Edition, Wiley, 2003.
5. Alex Bezon, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, MeGraw-Hill Edition,

2001.
6. Paulraj Ponniah, “Data Warehousing Fundamentals”, Wiley-Interscience Publication, 2003.

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FOURTH YEAR

Semester – VIII

Electives - III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Advanced Network Administration	CS - 8031

UNIT I

INTRODUCTION TO NETWORKING AND FUNDAMENTALS

Introduction – Data Communications, Networks, Internet, Protocols and Standard – Network Models – Layered tasks – Internet Model – OSI Model – VPN – DSL Technology – Cable Modem – Connecting devices – Backbone Networks – Virtual LANS – Circuit switching and Telephone Networks.

UNIT II

NETWORKING MEDIA

Data transmission – Analog and Digital Data transmission – Transmission Impairments – Transmission Media – LAN Technology.

UNIT III

ETHERNET FUNDAMENTALS

Local Area Networks: Ethernet – Traditional Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LANs – IEEE802.11 – Virtual Circuit Switching – Frame Relay – ATM – Cellular Telephony.

UNIT IV

TCP / IP PROTOCOL SUITE AND IP ADDRESSING

Internet Protocols – Principles of Internetworking – Connectionless Internetworking – Internet Protocol – Ipv6 – IP Multicasting – Transport Protocols – Connection Oriented Transport Protocol Mechanisms – TCP – TCP Congestion Control – UDP – Network Security.

UNIT V

TCP APPLICATION LAYER AND ROUTING FUNDAMENTALS

DNS – SMTP and FTP – E-mail – File Transfer – Routing – Unicast Routing – Unicast Routing Protocols – Multicast Routing – Multicast Routing Protocols.

TEXT BOOKS :

1. Behrouz A. Forouzan, “Data Communication and Networking”, Tata McGraw-Hill, 2004.
2. William Stallings, “Data and Computer Communication”, 6th Edition, Pearson Education, 2002.
3. Andrew S. Tanenbaum, “Computer Networks”, PH1, 4th Edition, 2003.

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B.E. (Computer Science & Engineering)

FOURTH YEAR

Semester – VIII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Relational Databases	CS - 8032

UNIT I

INTRODUCTION TO SQL

Writing Basic SQL SELECT statements, Restricting and Sorting data, Single-Row functions, Displaying Data from Multiple Tables, Aggregating Data using Group Functions, Sub queries, Producing Readable Output with iSQL*Plus, Manipulating Data, Creating and Managing tables, Including Constraints.

UNIT II

DATA MANIPULATION COMMANDS

Creating Views, Other Database Objects, Controlling User Access, SQL Workshop, Using SET Operators, Oracle9i: Date time functions, Enhancement to GROUP BY Clause, Advanced sub queries, Hierarchical Retrieval, Oracle9i: Extensions to DML and DDL statements.

UNIT III

DATABASE ADMINISTRATION

Oracle Architectural Components, Getting Started with Oracle Server, Managing an Oracle Instance, Creating Database, Using Data Dictionary and Dynamic Performance Views.

UNIT IV

TABLE MEMORY MANAGEMENT

Maintaining the Control file, Maintaining Online Redo Log Files, Managing Table Spaces and Data Files, Storage Structure and Relationships, Managing Undo Data.

UNIT V

ADVANCED RELATIONAL OPERATIONS

Managing Tables, Managing indexes, Maintaining Data Integrity, Managing Password Security and Resources, Managing users, Managing Privileges, Managing Roles, Auditing, Loading Data into a Database, Using Globalization Support.

TEXT BOOKS :

1. C.J. Date, Database Systems, Addison Wesley, 2000
2. Chip Dawes, Biju Thomas, Introduction to Oracle 9i SQL, BPB, 2002
3. Bob Bryla, Biju Thomas, Oracle 9i DBA Fundamental I, BPB, 2002
4. Doug Stums, Matthew Weshan, Oracle 9i DBA Fundamental I, BPB, 2002
5. Joseph C. Johnson, Oracle 9i Performance Tuning., BPB, 2002
6. Kevin Loney , George Koch, “Oracle8i: The Complete Reference "
7. Noel Yuhanna, “Oracle8i Database Administration”.

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FOURTH YEAR

Semester – VIII

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Enterprise Resource Planning	CS - 8033

UNIT I

INTRODUCTION TO ERP

Integrated Management Information Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering– Principle of Business Engineering – Business Engineering with Information Technology.

UNIT II

BUSINESS MODELLING FOR ERP

Building the Business Model – ERP Implementation – An Overview – Role of Consultant, Vendors and Users, Customisation – Precautions – ERP Post Implementation Options-ERP Implementation Technology – Guidelines for ERP Implementation.

UNIT III

ERP AND THE COMPETITIVE ADVANTAGE

ERP domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP-Market Dynamics and Dynamic Strategy.

UNIT IV

COMMERCIAL ERP PACKAGE

Description – Multi-Client Server Solution – Open Technology – User Interface- Application Integration.

UNIT V

SAP ARCHITECTURE

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface.

TEXT BOOK :

1. Vinod Kumar Garg and N.K.Venkita Krishnan, “Enterprise Resource Planning – Concepts and Practice”, PHI, 1998.

REFERENCE :

1. Jose Antonio Fernandz, The SAP R/3 Handbook, TMH, 1998.