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B.E. (Informational Technology)

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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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Electron Devices And Circuits	IT - 302

UNIT I

SEMI CONDUCTOR DEVICES

Semiconductor-PN Junction diode –BJT-FET-SCR-VI characteristics (qualitative Treatment only)

UNIT II

AMPLIFIERS

Transistor biasing – self biasing –DC and AC analysis of CE, CB and CC amplifiers. Power amplifiers-Efficiency. Tuned Amplifiers-Frequency Response.

UNIT III

FEED BACK AMPLIFIERS AND OSCILLATORS:

Negative feed back- Types feedback with examples for each type. Effect of feedback on ac characteristic of amplifiers. Positive Feedback – oscillators-Analysis of RC Phase shift Oscillator and LXC oscillators – Hardly and colpitt.

UNIT IV

MULTIVIBRATORS AND TIMERS

Bistable, Monostable and Astable multivibrators using Transistors-triggering delay and frequency Calculation.555 Timer-Internal Block-Application.

UNIT V

OPERATIONAL AMPLIFIER AND APPLICATION

Operational amplifier- Characteristics-Block diagram only application of op-amp-Current to voltage, Voltage to current converters, Arithmetic circuits-Adder, Subtracter, multiplier, differentiator And Integrator. Active Filters - Butter worth and Chebyshev.

TEXT BOOKS :

1. Foyal, Electronic Device –Fifth Edition – Addison Wesley Long man Pt. Ltd Branch 2001.
2. David A. Bell Electronic Devices and Circuits –Prentice Hall of India.

REFERENCES:

1. Milman and Halkias,Integrated Electronics McGraw Hill publishers 1985.
2. Boyle stad Nashelsky - Electronic devices and Circuit Theory- Prentice hall of India Pvt. 6th edition.

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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Computer Architecture	IT - 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
IT	Data Structures	IT - 304

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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SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Value Education	IT - 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
IT	**Computer Programming Laboratory**	**IT - 306**

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**	**IT - 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
IT	Design And Analysis Of Algorithms	IT - 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
IT	Database Management Systems	IT - 403

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 – IV

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Software Project Management	IT - 404

UNIT I

INTRODUCTION

Product Life Cycle, Project Life Cycle models, Process models.

UNIT II

UMBRELLA ACTIVITIES IN SOFTWARE PROJECT MANAGEMENT

Matrix, Software configuration Management, Software Quality Assurance, Risk Management.

UNIT III

PROJECT MANAGEMENT PROCESSES AND ACTIVITIES

Project Initiation, Project Planning and Tracking, Project closure.

UNIT IV

ENGINEERING ACTIVITIES

Software requirements, Gathering, Estimation, Design and development Phase, Project Management in the testing phase and maintenance phase.

UNIT V

IMPLEMENTATION ACTIVITIES

Implementation of various types of CMM (Capability Maturity Model) ISO 9000

TEXT BOOKS :

1. Gopalaswamy Ramesh, Managing Global Software Project, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002.
2. Roger S.Pressman, Software Engineering, A Practitioner's approach, McGraw-Hill International Edition, New Delhi, 2001.

REFERENCES :

1. Walker Royce, Software Project Management, A Unified frame work, Pearson Education Asia, New Delhi, 2000.
2. Steve McConnel, Rapid Development, WP Publishers & Distributors (P) Limited, Microsoft Press, Bangalore, 1996.
3. Bob Hughes and Mike Cofferell, Software Project Management, Tata McGraw-Hill Publishing Company Limited, New Delhi,1999.
4. Kieron Conway, Software Project Management, Coriolis Group, Dreamtech Press, New Delhi, 2000.

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Data Communication	IT - 405

Unit I

Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, - Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise, Nyquist bit rate ,Shannon capacity ,Throughout, delay ,Jitter, Bandwidth delay product

Unit II

Data communication concepts – Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex,half duplex and fullduplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations-Point to point and point to multipoint configuration.

Unit III

Telephone Network-Network topology, signaling- SS7,dial-up modems, modem standard, digital subscriber line – ADSL,SDSL,VDSL .Multiplexing,Frequency division multiplexing, time division multiplexing and wavelength division multiplexing, pulse code modulation, pleisochronous digital hierarchy(PDH), synchronous digital hierarchy (SDH) ,STM -1 frame, virtual container, mapping of data signals on STM- 1.

Unit IV

Switching techniques- Circuit , packet and hybrid switching, Types of error, single bit error, burst error, Error detection , Vertical redundancy check, Longitudinal redundancy check, cyclic redundancy check,error correction, Integrated services digital network, ISDN interface, ISDN devices, reference points ,ISDN services, ISDN Protocols

Unit V

Transmission media-Guided and unguided media, twisted pair ,Unshielded twisted pair and Shielded twisted pair, coaxial cable and fiber optic cable, radio waves, microwaves and infrared transmission RJ-45,Network interface card, rack, cable standard-Category 5,6,and 7,cross connection, straight connection cable coding standards.

References:-

1. "Data communication and networking", Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta ,PHI Learning
3. **"**Computer Networks" - Tanenbaum ,PHI Learning.

4. “Communication Networks-Fundamental concepts and key Architectures”, Leon-Garcia,Widjaja, TMH
5. “Computer Communications & Networking Technologies”-Michael A. Gallo & William M. Hancock Cengage pearsen publications
6. “Network for computer scientists & engineers” –Youlu zheng & shakil akhtar , Oxford pub.

Suggested List of Experiment

1. Case Study of digital interface RS-232
2. Case Study of Synchronous and asynchronous transmission
3. Case Study of various multiplexing techniques
4. Case Study of Parallel and serial transmission
5. ISDN implementation for internet
6. ISDN Devices
7. Study of SDH
8. Study of Network Interface Card
9. Study of twisted pair,coaxial cable and Fiber optic cable
10. Study of cross cable connection and straight cable connection
11. Study of digital subscriber line-ADSL for broadband connection
12. Study of NRZ and RZ Codes

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SECOND YEAR

Semester – IV

Course Content & Grade

Branch	Subject Title	Subject Code
IT	**Unix/Linux**	**IT - 406**

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
IT	Digital Circuit & System	IT - 501

Unit I

Number systems & codes, Binary arithmetic , Boolean algebra and switching function. Minimization of switching function, Concept of prime implicant, Karnaugh map method, Quine & McCluskey's method, Cases with don't care terms, Multiple output switching function.

Unit II

Introduction to logic gates, Universal gate, Half adder, Half subtractor, Full adder, Full subtractor circuits, Series & parallel addition , BCD adders, Look-ahead carry generator.

Unit III

Linear wave shaping circuits, Bistable, Monostable & Astable multivibrator, Schmitt trigger circuits & Schmitt-Nand gates. Logic families : RTL, DTL, All types of TTL circuits , ECL, I2L , PMOS, NMOS & CMOS logic, Gated flip-flops and gated multivibrator , Interfacing between TTL to MOS.

Unit IV

Decoders, Encoders, Multiplexers, Demultiplexers, Introduction to various semiconductor memories & designing with ROM and PLA. Introduction to Shift Registers, Counters, Synchronous & asynchronous counters, Designing of Combinational circuits like code converters.

Unit V

Introduction of Analog to Digital & Digital to Analog converters, sample & hold circuits and V-F converters.

References:

1. M. Mano; "Digital Logic & Computer Design"; PHI.
2. Malvino & Leach; "Digital Principles & Applications"; TMH
3. W.H. Gothman; "Digital Electronics"; PHI.
4. Millman & Taub; "Pulse, Digital & Switching Waveforms"; TMH
5. Jain RP; Modern digital Electronics; TMH
6. R.J. Tocci, "Digital Systems Principles & Applications".

List of experiment (Expandable)

1. To study and test of operation of all logic gates for various IC's (IC#7400,IC#7403,IC# 7408,IC#74332,IC#7486).

2. Verification of Demorgan’s theorem.
3. To construct of half adder and full adder
4. To construct of half subtractor and full subtractor circuits
5. Verification of versatility of NAND gate.
6. Verification of versatility of NOR gate.
7. Designing and verification of property of full adder.
8. Design a BCD to excess-3 code converter.
9. Design a Multiplexer/ Demultiplexer.

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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Computer Graphics And Multimedia	IT - 502

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 – V

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Operating Systems	IT - 503

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.
4. Write a program to implement classical inter process communication problem.
5. Write a program to implement classical inter process communication problem.
6. 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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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Theory of Computation	IT - 504

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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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Computer Networks	IT - 505

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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THIRD YEAR

Semester – V

Course Content & Grade

Branch	Subject Title	Subject Code
IT	C# & .Net Framework	IT - 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
IT	Web Technology	IT - 601

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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THIRD YEAR

Semester – VI

Course Content & Grade

Branch	Subject Title	Subject Code
IT	**Java Programming**	**IT - 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
IT	Information Storage And Management	IT - 701

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 comparision. 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 ramework 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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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Soft Computing	IT - 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
IT	Data Warehousing And Data Mining	IT - 703

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 – VII

Elective - I

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Embedded System	IT - 7041

UNIT I

INTRODUCTION TO EMBEDDED SYSTEMS

Definition and Classification – Overview of Processors and hardware units in an embedded system– Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits

UNIT II

DEVICES AND BUSES FOR DEVICES NETWORK

I/O Devices - Device I/O Types and Examples – Synchronous - Iso-synchronous and Asynchronous Communications from Serial Devices - Examples of Internal Serial-Communication Devices - UART and HDLC - Parallel Port Devices - Sophisticated interfacing features in Devices/Ports- Timer and Counting Devices - '12C', 'USB', 'CAN' and advanced I/O Serial high speed buses- ISA, PCI, PCI-X, cPCI and advanced buses.

UNIT III

PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C, C++

Programming in assembly language (ALP) vs. High Level Language - C Program Elements, Macros and functions -Use of Pointers - NULL Pointers - Use of Function Calls – Multiple function calls in a Cyclic Order in the Main Function Pointers – Function Queues and Interrupt Service Routines Queues Pointers – Concepts of EMBEDDED PROGRAMMING in C++ - Objected Oriented Programming – Embedded Programming in C++, 'C' Program compilers – Cross compiler
– Optimization of memory codes.

UNIT IV

REAL TIME OPERATING SYSTEMS – PART - 1

Definitions of process, tasks and threads – Clear cut distinction between functions – ISRs and tasks by their characteristics – Operating System Services- Goals – Structures- Kernel - Process Management – Memory Management – Device Management – File System Organisation and Implementation – I/O Subsystems – Interrupt Routines Handling in RTOS, REAL TIME OPERATING SYSTEMS : RTOS Task scheduling models - Handling of task scheduling and latency and deadlines as performance metrics – Co-operative Round Robin Scheduling – Cyclic Scheduling with Time Slicing (Rate Monotonics Co-operative Scheduling) – Preemptive Scheduling Model strategy by a Scheduler – Critical Section Service by a Preemptive Scheduler – Fixed (Static) Real time scheduling of tasks - INTER PROCESS COMMUNICATION AND

SYNCHRONISATION – Shared data problem – Use of Semaphore(s) – Priority Inversion Problem and Deadlock Situations – Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual (Logical) Sockets – Remote Procedure Calls (RPCs).

UNIT V

REAL TIME OPERATING SYSTEMS – PART - 2

Study of Micro C/OS-II or Vx Works or Any other popular RTOS – RTOS System Level Functions– Task Service Functions – Time Delay Functions – Memory Allocation Related Functions – Semaphore Related Functions – Mailbox Related Functions – Queue Related Functions – Case Studies of Programming with RTOS – Understanding Case Definition – Multiple Tasks and their functions – Creating a list of tasks – Functions and IPCs – Exemplary Coding Steps.

TEXT BOOK :

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003

REFERENCES :

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes,
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.
3. Wayne Wolf, Computers as Components; Principles of Embedded Computing System Design– Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001
4. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware / Software Introduction, John Wiley, 2002.

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B.E. (Informational Technology)

FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Software Quality Assurance	IT - 7042

UNIT I

CONCEPTS

Concepts of Quality Control, Quality Assurance, Quality Management - Total Quality Management; Cost of Quality; QC tools - 7 QC Tools and Modern Tools; Other related topics - Business Process Re-engineering – Zero Defect, Six Sigma, Quality Function Deployment, Benchmarking, Statistical process control.

UNIT II

SOFTWARE ENGINEERING CONCEPTS

Software Engineering Principles, Software Project Management, Software Process, Project and Product Metrics, Risk Management, Software Quality Assurance; Statistical Quality Assurance - Software Reliability, Muse Model; Software Configuration Management; Software Testing; CASE (Computer Aided Software Engineering).

UNIT III

QUALITY ASSURANCE MODELS

Models for Quality Assurance-ISO-9000 - Series, CMM, SPICE, Malcolm Baldrige Award.

UNIT IV

SOFTWARE QUALITY ASSURANCE RELATED TOPICS

Software Process - Definition and implementation; internal Auditing and Assessments; Software testing - Concepts, Tools, Reviews, Inspections & Walkthroughts; P-CMM.

UNIT V

FUTURE TRENDS

PSP and TSP, CMMI, OO Methodology, Clean-room software engineering, Defect injection and prevention.

TEXT BOOK :

1. Watts Humphery, “Managing Software Process ", Addison - Wesley, 1998.

REFERENCES :

1. Philip B Crosby, " Quality is Free: The Art of Making Quality Certain ", Mass Market, 1992.
2. Roger Pressman, “Software Engineering ", Sixth Edition, McGraw Hill, 2005

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FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Cryptography And Network Security	IT - 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

Elective - II

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Robotics	IT - 7051

UNIT I

ROBOTIC MANIPULATION

Robotic manipulation – Automation and Robots – Robot Classification – Applications – Robot Specifications – Notation. Direct Kinematics: The ARM Equation – Dot and Cross products – Coordinate frames – Rotations – Homogeneous coordinates – Link coordinates – The arm equation – A five-axis articulated robot (Rhino XR-3) – A four-axis SCARA Robot (Adept One) – A six-axis articulated Robot (Intelledex 660). Inverse Kinematics: Solving the arm equation – The inverse kinematics problem – General properties of solutions – Tool configuration – Inverse kinematics of a five-axis articulated robot (Rhino XR-3) – Inverse kinematics of a four-axis SCARA robot (Adept one) - Inverse kinematics of a six-axis articulated robot (Intelledex 660) - Inverse kinematics of a three-axis articulated robot – A robotic work cell.

UNIT II

DYNAMIC OF ROBOTS

Workspace analysis and trajectory planning: Workspace analysis – Work envelop of a five-axis articulated robot – Work envelope of a four-axis SCARA robot – Workspace fixtures – The pick-and- place operation – Continuous-path motion – Interpolated motion – Straight-line motion. Differential motion and statics: The tool-configuration Jacobian matrix – Joint-space singularities – Generalized Inverses – Resolved-Motion rate control:n<=6 – Rate control of redundant robots:n>6 – rate control using {1}-inverses – The manipulator Jacobian – Induced joint torques and forces. Manipulator Dynamics: Lagrange's equation – Kinetic and Potential energy – Generalized force – Lagrange-Euler dynamic model – Dynamic model of a two-axis planar articulated robot - Dynamic model of a three-axis SCARA robot – Direct and Inverse dynamics – Recursive Newton-Euler formulation – Dyamic model of a one-axis robot.

UNIT III

ROBOT CONTROL

Robot control: The control problem – State equation – Constant solutions – Linear feedback systems - Single-axis PID control – PD-Gravity control – Computed-Torque control – Variable- Structure control– Impedance control

UNIT IV

SENSORS AND ACTUATORS

Actuators - Introduction – Characteristics of actuating systems – Comparison of actuating systems– Hydraulic

devices – Pneumatic devices – Electric motors – Microprocessor control of electric motors – Magnetostricitve actuators – Shape-memory type metals – Speed reduction. Sensors – Introduction – Sensor characteristics – Position sensors – Velocity sensors – Acceleration sensors– Force and pressure sensors – Torque sensors – Microswitches – Light and Infrared sensors –Touch and Tactile sensors – Proximity sensors – Range-finders – Sniff sensors – Vision systems– Voice Recognition devices – Voice synthesizers – Remote center compliance device.

UNIT V

VISION AND TASK PLANNING

Robot vision – Image representation – Template matching – Polyhedral objects – Shape analysis– Segmentation – Iterative processing – Perspective Transformations – Structured illumination–Camera calibration. Task planning: Task-level programming – Uncertainty – Configuration space– Gross-Motion planning – Grasp planning – Fine-Motion planning – Simulation of planar motion– A task-planning problem.

TEXT BOOKS :

1. Robert J.Schilling, “Fundamentals of Robotics – Analysis & Control”, Prentice Hall of India Pvt. Ltd., 2002.
2. Saeed B.Niku, “Introduction to Robotics – Analysis, Systems, Applications”, Prentice Hall of India Pvt. Ltd., 2003.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Informational Technology)

FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Grid Computing	IT - 7052

UNIT I

GRID COMPUTING

Introduction - Definition and Scope of grid computing

UNIT II

GRID COMPUTING INITIALIVES

Grid Computing Organizations and their roles – Grid Computing analog – Grid Computing road map.

UNIT III

GRID COMPUTING APPLICATIONS

Merging the Grid sources – Architecture with the Web Devices Architecture.

UNIT IV

TECHNOLOGIES

OGSA – Sample use cases – OGSA platform components – OGSI – OGSA Basic Services.

UNIT V

GRID COMPUTING TOOL KITS

Globus GT 3 Toolkit – Architecture, Programming model, High level services – OGSI .Net middleware Solutions.

TEXT BOOK :

1. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson/PHI PTR-2003.

REFERENCE :

1. Ahmar Abbas, “Grid Computing: A Practical Guide to technology and Applications”, Charles River media – 2003.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Informational Technology)

FOURTH YEAR

Semester – VII

Course Content & Grade

Branch	Subject Title	Subject Code
IT	TCP/IP Design & Implementation	IT - 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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B.E. (Informational Technology)

FOURTH YEAR

Semester – VIII

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Object Oriented Analysis And Design	IT - 801

UNIT I

INTRODUCTION

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development 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
IT	**E- Commerce Technology**	**IT - 802**

UNIT I

E-Commerce Framework

Introduction – Electronic Commerce Framework – The Anatomy of E-Commerce Applications. The Network Infrastructure for E-Commerce, The Internet as a Network Infrastructure.

UNIT II

Electronic Systems for Payment

Electronic Payment Systems, Interorganizational Commerce and EDI, EDI Implementation, MIME and Value – added Networks.

UNIT III

E-Commerce Advertising and Marketing

Advertising and Marketing on the Internet, Computer Based Education and Training, Technological Components of Education on-Demand, Digital Copy rights and Electronic Commerce, Software Agent.

UNIT IV

Business Documents and Digital Library

The Corporate Digital Library – Dimensions of Internal Electronics Commerce Systems, Making a Business case for a document Library, Types of Digital documents, Issues behind document Infrastructure, Corporate data warehouses, Documents Active / Compound document architecture.

UNIT V

Multimedia Systems for E-Commerce

Multimedia and Digital Video – Broad band Telecommunications – Mobile and Wireless Computing Fundamentals.

TEXT BOOK :

1. Kalakota & Whinston, “Frontiers of Electronic Commerce”, Pearson Education, 2002.

REFERENCES :

1. Kamalesh K. Bajaj, “E-Commerce: The Cutting Edge & Business”, Tata McGraw-Hill, 2003.
2. Brenda Kennan, “Managing your E-Commerce Business”, PHI, 2001.
3. Elias M. Awad, “Electronic Commerce from Vision to Fulfillment”, PHI, Feb-2003.

4. Bharat Bhaskar, “Electronic Commerce – Framework, Technology and Application”, TMH, 2003.
5. Effy Oz, “Foundations of E-Commerce”, PHI, 2001.
6. Jim A Carter, “Developing E-Commerce Systems”, PHI, 2001.

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B.E. (Informational Technology)

FOURTH YEAR

Semester – VIII

Electives - III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Speech Technology	IT - 8031

UNIT I

SPEECH SIGNALS IN HUMAN-MACHINE INTERACTION

Importance of Speech Systems in Human-machine Interaction - Review of Signals and Systems: Vector Spaces and Signal Spaces - Sampling Theorem - Discrete Time Fourier transform – Z-transform - Discrete Fourier transform.

UNIT II

NATURE OF SPEECH SIGNALS

Source-system characteristics - Segmental and Suprasegmental features - Temporal and spectral parameters of sound units.

UNIT III

SPEECH SIGNAL PROCESSING METHODS

Short-time spectrum analysis – Spectrograms - Linear Prediction analysis - Cepstrum Analysis.

UNIT IV

SPEECH RECOGNITION AND SYNTHESIS

Approaches to Speech recognition - Template based methods, DTW based methods, HMMs - Approaches to Speech Synthesis - Concatenative speech synthesis, PSOLA

UNIT V

CASE STUDIES

Speech recognition: Isolated word recognition; Connected word recognition; Speaker Identification, Syllable-based recognition, Spoken language Identification.

TEXT BOOKS :

1. Oppenheim and Schafer, "Discrete-Time Signal Processing," PHI, 2001
2. Rabiner and Schafer, "Digital Processing of Speech Signals," Pearson Education, 1993.
3. Rabiner and Juang, "Fundamentals of Speech Recognition," PHI, 1993.
4. Xuedong Huang, Alex Acero, Hsiao-wuen Hon, "Spoken Language Processing: A guide to Theory, Algorithm, and System Development,"Prentice Hall PTR, 2001.
5. Douglas O' Shaughnessy, "Speech Communications," University Press, 2001.

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B.E. (Informational Technology)

FOURTH YEAR

Semester – VIII

Electives - III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Nano Technology	IT - 8032

UNIT I

Electronic states in crystal energy bands, Concepts of 2D nanostructures (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. (Informational Technology)

FOURTH YEAR

Semester – VIII

Electives - III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Advanced Network Administration	IT - 8033

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.