ANNA UNIVERSITY COIMBATORE

REGULATIONS 2007-08

B.TECH INFORMATION TECHNOLOGY

SEMESTER V

Code No.	Course Title	L	T	P	M	C
THEORY						
	Probability and Queuing Theory	3	0	0	100	3
	Open Source Systems	3	1	0	100	4
	Database Management Systems	3	1	0	100	4
	Client Server Computing	3	0	0	100	3
	Microprocessors & Micro controllers	3	1	0	100	4
	Digital Signal Processing	3	1	0	100	4
PRACTICAL						
	Microprocessors & Micro controllers Lab	0	0	3	100	1.5
	DBMS Lab	0	0	3	100	1.5
	Communication skill & seminar	0	0	3	100	1.5

SEMESTER VI

Code No.	Course Title	L	T	P	M	C
THEORY						
	Communication Switching Techniques	3	1	0	100	4
	Principles of Compiler Design	3	1	0	100	4
	Object Oriented Analysis and Design*	3	0	0	100	3
	Numerical Methods	3	1	0	100	4
	Computer Networks	3	0	0	100	3
	Elective – I	3	0	0	100	3
PRACTICAL						
	Case tools Lab	0	0	3	100	1.5
	Compiler Design Lab	0	0	3	100	1.5
	Computer Networks Lab	0	0	3	100	1.5

SEMESTER V

PROBABILITY AND QUEUEING THEORY	L	T	P	M	C
	3	0	0	100	3

UNIT I PROBABILITY AND RANDOM VARIABLE 9 + 3

Axioms of probability - Conditional probability - Total probability – Baye's theorem- Random variable - Probability mass function - Probability density function - Properties - Moments

UNIT II STANDARD DISTRIBUTIONS 9 +3

Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions and their properties - Functions of a random variable.

UNIT III TWO DIMENSIONAL RANDOM VARIABLES 9 + 3

Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables

UNIT IV RANDOM PROCESSES AND MARKOV CHAINS 9 + 3

Classification - Stationary process - Markov process - Poisson process - Birth and death process - Markov chains - Transition probabilities

UNIT V QUEUEING THEORY 9 + 3

Markovian models – M/M/1, M/M/C , finite and infinite capacity - M/M/∞ queues - Finite source model - M/G/1 queue (steady state solutions only).

TUTORIAL 15
TOTAL : 60

REFERENCE BOOKS

Veerarajan., T., "Probability, Statistics and Random Processes", Tata McGraw-Hill, Second Edition, New Delhi, 2003.

Ross, S., "A first course in probability", Sixth Edition, Pearson Education, Delhi, 2002.

Medhi J., "Stochastic Processes", New Age Publishers, New Delhi, 1994. (Chapters 2, 3, & 4)

Taha, H. A., "Operations Research-An Introduction", Seventh Edition, Pearson Education Edition Asia, Delhi, 2002.

OPEN SOURCE SYSTEMS

L	T	P	M	C
3	1	0	100	3

UNIT I INTRODUCTION **9**

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources – Application of Open Sources. Open source operating systems: LINUX: Introduction – General Overview – Kernel Mode and user mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux. .

UNIT II OPEN SOURCE DATABASE **9**

MySQL: Introduction – Setting up account – Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time – Sorting Query Results – Generating Summary – Working with metadata – Using sequences – MySQL and Web.

UNIT III OPEN SOURCE PROGRAMMING LANGUAGES **9**

PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays – OOP – String Manipulation and regular expression – File handling and data storage – PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails – Debugging and error handling – Security – Templates.

UNIT IV PYTHON **9**

Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.

UNIT V OPEN SOURCE TOOLS AND TECHNOLOGIES **9**

Web Server: Apache Web server – Working with Web Server – Configuring and Using apache web services MDA: Introduction to MDA – Genesis of MDA – Meta Object Facility – UML – UML Profiles – MDA Applications.

Total: 45

REFERENCE BOOKS:

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002
3. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002
4. Wesley J. Chun, “Core Phython Programming”, Prentice Hall, 2001
5. Peter Wainwright, “Professional Apache”, Wrox Press, 2002
6. Stephen J. Mellor, Marc Balces, “Executable UMS: A foundation for MDA”, Addison Wesley, 2002

DATABASE MANAGEMENT SYSTEMS	L	T	P	M	C
	3	1	0	100	4

UNIT I INTRODUCTION AND CONCEPTUAL MODELING 9

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 9

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

UNIT III DATA STORAGE AND QUERY PROCESSING 9

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 9

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 9

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.

TOTAL : 45

REFERENCE BOOKS

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
3. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.

CLIENT SERVER COMPUTING	L	T	P	M	C
	3	0	0	100	3

UNIT I INTRODUCTION **9**

Client Server Computing era, Real Client/Server, Fat Servers or fat clients, 2 tier Vs 3 tier, Intergalactic client server, client server for different models, building blocks

UNIT II CLIENT/SERVER OPERATING SYSTEMS **9**

Anatomy of Server programs, Server needs from OS, Server scalability, Client anatomy, Client needs from OS, Client OS trends , MAC OS, Linux OS, Win OS, Server OS trends , NetWare, Win 2000 Server, OS/2 warp server

UNIT III CLIENT SERVER MIDDLEWARE **9**

NOS Middleware, global directory services, X.500, LDAP, distributed time services, distributed security services, RPC messaging and peer to peer **,** Sockets, NetWare, NetBIOS, remote procedure call, messaging and queuing, MOM Vs RPC, Evolution of the NOS, DCE , The enterprise NOS, the internet as NOS

UNIT IV CLIENT SERVER TRANSACTION PROCESSING **9**

ACID Properties, Transaction Models, TP Monitor, TP Monitor and OS, TP Monitor and Transaction Management, TP Monitor Client/ Server Interaction types, Transactional RPC, Queues, TP Lite or TP Heavy, TP Lite versus TP Heavy – Managing Heterogeneous networks, Process Management, client/server invocations.

UNIT V CLIENT SERVER AND INTERNET **9**

Client server and internet, Web client server, 3 tier client server web style, CGI , the server side of web, CGI and State, SQL database servers, Middleware and federated databases, data warehouses, EIS/DSS to data mining, GroupWare Server , what is GroupWare, components of GroupWare

Total 45

REFERENCE BOOKS:

1. Robert Orfali, Dan Harkey & Jeri Edwards, “Essential Client/Server Survival Guide”, second edition, John Wiley & Sons, Singapore, 2003.
2. James E. Goldman, Phillip T. Rawles, Julie R. Mariga, “Client/Server Information Systems, A Business Oriented Approach”, John Wiley & Sons, Singapore, 2000.
3. Eric J Johnson, “A complete guide to Client / Server Computing”, first edition, Prentice Hall, New Delhi, 2001.
4. Smith & Guengerich, “Client /Server Computing”, Prentice Hall, New Delhi, 2002

MICROPROCESSORS AND MICROCONTROLLERS	L	T	P	M	C
	3	1	0	100	4

UNIT I THE 8085 MICROPROCESSOR 9

Introduction to 8085 – Microprocessor architecture – Instruction set – Programming the 8085 – Code conversion.

UNIT II 8086 SOFTWARE ASPECTS 9

Intel 8086 microprocessor – Architecture – Instruction set and assembler directives – Addressing modes – Assembly language programming – Procedures – Macros – Interrupts and interrupt service routines.

UNIT III 8086 SYSTEM DESIGN 9

8086 signals and timing – MIN/MAX mode of operation – Addressing memory and I/O – Multiprocessor configurations – System design using 8086

UNIT IV I/O INTERFACING 8085 9

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications.

UNIT V MICROCONTROLLERS 9

Architecture of 8051 – Signals – Operational features – Memory and I/O addressing – Interrupts – Instruction set – Applications.

TUTORIAL 15
TOTAL : 60

REFERENCE BOOKS

1. Ramesh S.Gaonkar, “Microprocessor - Architecture, Programming and Applications with the 8085”, Penram International publishing private limited, fifth edition.
    a. (UNIT-1: – Chapters 3,5,6 and programming examples from chapters 7-10)
2. A.K. Ray & K.M.Bhurchandi, “Advanced Microprocessors and peripherals-Architectures, Programming and Interfacing”, TMH, 2002 reprint.
    a. (UNITS 2 to 5: – Chapters 1-6, 7.1-7.3, 8, 16)
3. Douglas V.Hall, “Microprocessors and Interfacing: Programming and Hardware”, TMH, Third edition
4. Yu-cheng Liu, Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design”, PHI 2003
5. Mohamed Ali Mazidi, Janice Gillispie Mazidi, “The 8051 microcontroller and embedded systems”, Pearson education, 2004.

DIGITAL SIGNAL PROCESSING	L	T	P	M	C
	3	1	0	100	4

UNIT I SIGNALS AND SYSTEMS 9

Basic elements of digital signal Processing –Concept of frequency in continuous time and discrete time signals –Sampling theorem –Discrete time signals. Discrete time systems –Analysis of Linear time invariant systems –Z transform –Convolution and correlation.

UNIT II FAST FOURIER TRANSFORMS 9

Introduction to DFT – Efficient computation of DFT Properties of DFT – FFT algorithms – Radix-2 and Radix-4 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms – Use of FFT algorithms in Linear Filtering and correlation.

UNIT III IIR FILTER DESIGN 9

Structure of IIR – System Design of Discrete time IIR filter from continuous time filter – IIR filter design by Impulse Invariance. Bilinear transformation – Approximation derivatives – Design of IIR filter in the Frequency domain.

UNIT IV FIR FILTER DESIGN 9

Symmetric & Antisymteric FIR filters – Linear phase filter – Windowing technique – Rectangular, Kaiser windows – Frequency sampling techniques – Structure for FIR systems.

UNIT V FINITE WORD LENGTH EFFECTS 9

Quantization noise – derivation for quantization noise power – Fixed point and binary floating point number representation – comparison – over flow error – truncation error – co-efficient quantization error - limit cycle oscillation – signal scaling – analytical model of sample and hold operations – Application of DSP – Model of Speech Wave Form – Vocoder.

TUTORIAL15

TOTAL : 60

REFERENCE BOOK

1. John G Proakis and Dimtris G Manolakis, “Digital Signal Processing Principles, Algorithms and Application”, PHI/Pearson Education, 2000, 3rd Edition.
2. Alan V Oppenheim, Ronald W Schafer and John R Buck, “Discrete Time Signal Processing”, PHI/Pearson Education, 2000, 2nd Edition.
3. Johny R.Johnson, “Introduction to Digital Signal Processing”, Prentice Hall of India/Pearson Education, 2002.
4. Sanjit K.Mitra, “Digital Signal Processing: A Computer – Based Approach”, Tata McGraw-Hill, 2001, Second Edition.
5. Flood J E., “Telecommunication Switching Traffic and Networks”, Pearson Education, New Delhi, 1995.
6. Syed Ali R., “Digital Switching Systems”, Tata McGraw Hill, New York, 1997

MICROPROCESSORS AND	L	T	P	M	C
MICROCONTROLLERS LAB	0	0	3	100	1.5

LIST OF EXPERIMENTS

1. Programming with 8085 – 8-bit / 16-bit multiplication/division using repeated addition/subtraction
2. Programming with 8085-code conversion, decimal arithmetic, bit manipulations.
3. Programming with 8085-matrix multiplication, floating point operations
4. Programming with 8086 – String manipulation, search, find and replace, copy operations, sorting. (PC Required)
5. Using BIOS/DOS calls: Keyboard control, display, file manipulation. (PC Required)
6. Using BIOS/DOS calls: Disk operations. (PC Required)
7. Interfacing with 8085/8086 – 8255, 8253
8. Interfacing with 8085/8086 – 8279,8251
9. 8051 Microcontroller based experiments – Simple assembly language programs (cross assembler required).
10. 8051 Microcontroller based experiments – Simple control applications (cross assembler required).

DATABASE MANAGEMENT SYSTEMS LAB	L	T	P	M	C
	0	0	3	100	1.5

LIST OF EXPERIMENTS

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

COMMUNICATION SKILLS & SEMINAR

UNIT I

Strategies to Develop Communication Skills

Listening Skill

Importance of Listening - Hearing Versus Listening - Listening Process - Types of Listening - Benefits of Good Listening - Effective Listening Strategies - Preparing to Overcome Barriers to Listening - Evaluating your Listening Skill

UNIT II

Speaking Skill

Speech Style - Content - Audience - Formal and Informal - Improving Fluency - Voice Modulation- Good Pronunciation - Accent and Intonation - Word Stress - Body Language

UNIT III

Reading Skill

Reading with a Purpose - Active and Passive Reading - Speed - Skimming and Scanning - Techniques to Improve Reading Skills - SQ3R -

UNIT IV

Writing Skill

Effective Writing Strategies - Formal and Informal - Technical Writing - Structure - Coherence - Grammatical Accuracy - Letter Writing - Official / Personal / Business - Job Application - Writing Resume - E-mails - Report Writing - Journal Articles – Conference Papers

UNIT V

Seminar Presentation

Significance of Presentation Skills - Purpose - Gathering Resources - Topic - Content - Audience Analysis - Planning - Preparing - Organising - Delivery - Use of Audio - Visual aids - Rehearsal - Developing Confidence.

SEMESTER VI

COMMUNICATION SWITCHING TECHNIQUES	L	T	P	M	C
	3	1	0	100	4

UNIT I BASICS OF TELECOMMUNICATION AND DATA NETWORKS 9

Sound Propagation and the Telephone set, Telephone Network structure, Local loop, central office switch, Trunks, Full Network, Private Network, PBX, Traditional Vs IP Telephony, North American Numbering plan, special Numbers.

Evaluation of computing, Main Frames, client/server computing, OSI-ISO reference Model, systems Network Architecture, Internet protocol side, SOHO Network, small company Network, Enterprise Network.

UNIT II SWITCHING AND ROUTING 9

Switching Basics: Circuit switching – Packet Switching – Types of packet Switching Networks – Connectionless packet networks – connection oriented packet Networks. Switches : Circuit switches- packet switches Role of Network Layer – connection – oriented networks – connectionless networks - Routers and routing – Direct and Indirect Routing.

UNIT III SIGNALLING AND MULTIPLEXING 9

History of signaling – SS7 design and Implementation – SS7 components – SS7 protocol architecture - Intelligent Networks – Examples of Intelligent Network services – Future of Intelligent Network. TDMA, FDMA,CDMA- Comparison of TDMA, FDMA,CDMA – GSM – 3G wireless, SONET Multiplexing, SONET rings.

UNIT IV TRAFFIC ENGINEERING 9

Network Traffic load and parameters, Grade of Service and Blocking Probability, Modelling Switching Systems, Incoming traffic and service time characterization, Blocking Models and Loss estimates, Delay systems.

UNIT V INTEGERATED SERVICES DIGITAL NETWORK 9

Need for ISDN – ISDN services – Network and Protocol Architecture – Transmission channels – User – Network Interfaces, signaling, Numbering and Addressing, service characterization, ISDN standards, Broad Band ISDN, voice Data Integration.

Total 45

REFERENCES BOOKS:

1. Viswanathan T, “Telecommunication Switching System and Networks”, Prentice Hall, New Delhi, 2004.
2. William Stallings, “Wireless Communication and Networks”, Second edition, Pearson Education, New Delhi, 2004.
3. John. C. Bellamy, “Digital Telephony”, John Wiley & Sons, Singapore, 2000.
4. Behrouz Forouzan, “Introduction to Data Communication and Networking”, Tata McGraw Hill, New Delhi, 1996.

5. Marion Cole, “Introduction to Telecommunications Voice, Data & the Internet”, Pearson Education, New Delhi, 2002.
6. Flood J E., “Telecommunication Switching Traffic and Networks”, Pearson Education, New Delhi, 1995.
7. Syed Ali R., “Digital Switching Systems”, Tata McGraw Hill, New Delhi, 2003.

PRINCIPLES OF COMPILER DESIGN

L	T	P	M	C
3	1	0	100	4

UNIT I INTRODUCTION TO COMPILING 9

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II SYNTAX ANALYSIS 9

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing **–** Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing **–** Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers **–** SLR Parser – Canonical LR Parser – LALR Parser.

UNIT III INTERMEDIATE CODE GENERATION 9

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT IV CODE GENERATION 9

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS 9

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TUTORIAL 15

TOTAL : 60

REFERENCE BOOKS

11. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.
12. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
13. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
14. Raghavan, “Introduction to Compilers”, Tata McGraw-Hill, 2008.
15. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.
16. Kenneth C. Louden, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

OBJECT ORIENTED ANALYSIS AND DESIGN	L	T	P	M	C
	3	0	0	100	3

UNIT I INTRODUCTION 8

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

UNIT II OBJECT ORIENTED METHODOLOGIES 12

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 9

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

UNIT IV OBJECT ORIENTED DESIGN 8

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

UNIT V SOFTWARE QUALITY AND USABILITY 8

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

TUTORIAL 15
TOTAL : 60

***REFERENCE* BOOKS**

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999
2. Martin Fowler, “UML Distilled”, Second Edition, PHI/Pearson Education, 2002.
3. Stephen R. Schach, “Introduction to Object Oriented Analysis and Design”, Tata McGraw-Hill, 2003.
4. James Rumbaugh, Ivar Jacobson, Grady Booch “The Unified Modeling Language Reference Manual”, Addison Wesley, 1999.

NUMERICAL METHODS

L	T	P	M	C
3	1	0	100	4

UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

Linear interpolation methods (method of false position) – Newton's method – Statement of Fixed Point Theorem – Fixed point iteration: x=g(x) method – Solution of linear system by Gaussian elimination and Gauss-Jordon methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods- Inverse of a matrix by Gauss Jordon method – Eigenvalue of a matrix by power method.

UNIT II INTERPOLATION AND APPROXIMATION 9+ 3

Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton's forward and backward difference formulas.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 9+ 3

Derivatives from difference tables – Divided differences and finite differences – Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules – Romberg's method – Two and Three point Gaussian quadrature formulas – Double integrals using trapezoidal and Simpson's rules.

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 9+ 3

Single step methods: Taylor series method – Euler and modified Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne's and Adam's predictor and corrector methods.

UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS 9+ 3

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

TUTORIAL 15

TOTAL : 60

REFERENCE BOOKS

1. Gerald, C.F, and Wheatley, P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Veerarajan T, "Numerical Methods", Tata McGraw-Hill, New Delhi, 2004.
3. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 1999.
4. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003.
5. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.

COMPUTER NETWORKS

L	T	P	M	C
3	0	0	100	3

UNIT I DATA COMMUNICATIONS 8

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 10

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 10

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

UNIT IV TRANSPORT LAYER 9

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 8

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

TOTAL : 45

REFERENCE BOOKS:

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, Fourth Edition, 2006.
2. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
3. Larry L.Peterson and Peter S. Davie, “Computer Networks”, Harcourt Asia Pvt. Ltd., Second Edition.
4. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
5. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.

CASE TOOLS LAB

L	T	P	M	C
0	0	3	100	1.5

1. Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.
2. Program Analysis and Project Planning.
   Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
3. Software requirement Analysis
   Describe the individual Phases / Modules of the project, Identify deliverables.
4. Data Modeling
   Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.
5. Software Development and Debugging
6. Software Testing
   Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

SUGGESTED LIST OF APPLICATIONS

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

COMPILER DESIGN LAB

L	T	P	M	C
0	0	3	100	1.5

1 & 2 Implement a lexical analyzer in “C”.

3. Use LEX tool to implement a lexical analyzer.

4. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.

5. Use YACC and LEX to implement a parser for the same grammar as given in problem

6. Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.

7 & 8. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.

9 &10. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

COMPUTER NETWORKS LAB

L	T	P	M	C
0	0	3	100	1.5

1. Applications using TCP Sockets like
    a. Echo client and echo server
    b. File transfer
    c. Remote command execution
    d. Chat
    e. Concurrent server
2. Applications using UDP Sockets like
    a. DNS
    b. SNMP
3. Applications using Raw Sockets like
    a. Ping
    b. Trace route
4. RPC
5. Experiments using simulators like OPNET:
    a. Performance comparison of MAC protocols
    b. Performance comparison of Routing protocols
    c. Study of TCP/UDP performance

Total : 45

LIST OF ELECTIVES

SEMESTER VI

Code No.	Course Title	L	T	P	M	C
	Resource Management Techniques	3	0	0	100	3
	UNIX Internals	3	0	0	100	3
	High Performance Microprocessors	3	0	0	100	3
	Data Warehousing and Mining	3	0	0	100	3
	Visual Programming	3	0	0	100	3
	Intellectual Property Rights	3	0	0	100	3
	Indian Constitution and Society	3	0	0	100	3
	Information Coding Techniques	3	0	0	100	3

ELECTIVES

SEMESTER VI

RESOURCE MANAGEMENT TECHNIQUES 3 0 0 100 3

Unit I LINEAR PROGRAMMING: 9

Principal components of decision problem – Modeling phases – LP Formulation and graphic solution – Resource allocation problems – Simplex method – Sensitivity analysis.

Unit II. DUALITY AND NETWORKS: 9

Definition of dual problem – Primal – Dual relation ships – Dual simplex methods – Post optimality analysis – Transportation and assignment model shortest route problem.

Unit III INTEGER PROGRAMMING: 9

Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic) programming.

Unit IV CLASSICAL OPTIMISATION THEORY: 9

Unconstrained external problems, Newton – Ralphson method – Equality constraints – Jacobean methods – Lagrangian method – Kuhn – Tucker conditions – Simple problems.

Unit V OBJECT SCHEDULING: 9

Network diagram representation – Critical path method – Time charts and resource leveling – PERT.

TOTAL = 45

REFERNECE BOOKS:

1. Anderson ‘Quantitative Methods for Business’, 8th Edition, Thomson Learning, 2002.
2. Winston ‘Operation Research’, Thomson Learning, 2003.
3. H.A.Taha, ‘Operation Research’, Prentice Hall of India, 2002.
4. Vohra, ‘Quantitative Techniques in Management’, Tata McGraw Hill, 2002.
5. Anand Sarma, ‘Operation Research’, Himalaya Publishing House, 2003.

UNIX INTERNALS 3 0 0 100 3

UNIT I GENERAL OVERVIEW OF THE SYSTEM 9

History – System structure – User perspective – Operating system services – Assumptions about hardware. Introduction to the Kernel : Architecture of the UNIX operating system – Introduction to system concepts – Kernel data structures – System administration – Summary and Preview.

UNIT II BUFFER CACHE 9

Buffer headers – Structure of the buffer pool – Advantages and disadvantages of the buffer cache. Internal representation of files : Inodes – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super block – Other file types**.**

UNIT III SYSTEM CALLS FOR FILE SYSTEM 9

Open – Read – Write – File and record locking – Adjusting the position of file I/O – LSEEK – Close – File creation – Creation of special files – Pipes – Dup – Mounting and unmounting file systems

UNIT IV THE STRUCTURE OF PROCESSES 9

Process states and transitions – Layout of system memory – The context of a process – Saving the context of a process. Process Control: Process creation – Signals – Process termination – Awaiting process termination – Invoking other programs – The shell – System boot and the INIT process.

UNIT V PROCESS SCHEDULING AND MEMORY MANAGEMENT POLICIES 9

Process Scheduling – Memory Management Policies : Swapping – A hybrid system with swapping and demand paging. The I/O Subsystem : Driver Interfaces– Disk Drivers- Terminal Drivers.

TOTAL : 45

REFERENCE BOOKS:

1. Maurice J. Bach, “The Design of the Unix Operating System”, Prentice Hall of India, 2004.
2. Vahalia, “Unix Internals: The New Frontiers”, Pearson Education Inc, 2003.

HIGH PERFORMANCE MICROPROCESSORS 3 0 0 100 3

UNIT I CISC PRINCIPLES 9

Classic CISC microprocessors, Intel x86 Family: Architecture - register set - Data formats - Addressing modes - Instruction set - Assembler directives – Interrupts - Segmentation, Paging, Real and Virtual mode execution – Protection mechanism, Task management 80186, 286, 386 and 486 architectures.

UNIT II PENTIUM PROCESSORS 10

Introduction to Pentium microprocessor – Special Pentium Registers – Pentium Memory Management – New Pentium instructions – Introduction to Pentium Pro and its special features – Architecture of Pentium-II, Pentium-III and Pentium4 microprocessors.

UNIT III RISC PRINCIPLES 10

RISC Vs CISC – RISC properties and evaluation – On chip register File Vs Cache evaluation – Study of a typical RISC processor – The PowerPC – Architecture & special features – Power PC 601 – IBM RS/6000, Sun SPARC Family – Architecture – Super SPARC.

UNIT IV RISC PROCESSOR 8

MIPS Rx000 family – Architecture – Special features – MIPS R4000 and R4400 – Motorola 88000 Family – Architecture – MC 88110 – MC 88100 and MC 88200.

UNIT V SPECIAL PURPOSE PROCESSORS 8

EPIC Architecture – ASIPs – Network Processors – DSPs – Graphics / Image Processors.

TOTAL : 45

REFERENCE BOOKS

1. Daniel Tabak, “Advanced Microprocessors”, Tata McGraw-Hill, 1995, 2nd Edition.

DATA WAREHOUSING AND MINING 3 0 0 100 3

UNIT I INTRODUCTION AND DATA WAREHOUSING 8

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 8

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 9

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

UNIT IV CLASSIFICATION AND CLUSTERING 12

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 8

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

TOTAL : 45

REFERENCE BOOK

1. J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2001.
2. Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education 2004.
3. Sam Anahory, Dennis Murry, “Data Warehousing in the real world”, Pearson Education 2003.
4. David Hand, Heikki Manila, Padhraic Symth, “Principles of Data Mining”, PHI 2004.
5. W.H.Inmon, “Building the Data Warehouse”, 3rd Edition, Wiley, 2003.
6. Alex Bezon, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, MeGraw-Hill Edition, 2001.
7. Paulraj Ponniah, “Data Warehousing Fundamentals”, Wiley-Interscience Publication, 2003.

3 0 0 100 3

VISUAL PROGRAMMING

UNIT I WINDOWS PROGRAMMING 10

Windows environment – a simple windows program – windows and messages – creating the window – displaying the window – message loop – the window procedure – message processing – text output – painting and repainting – introduction to GDI – device context – basic drawing – child window controls.

UNIT II VISUAL C++ PROGRAMMING – INTRODUCTION 9

Application Framework – MFC library – Visual C++ Components – Event Handling – Mapping modes – colors – fonts – modal and modeless dialog – windows common controls – bitmaps.

UNIT III THE DOCUMENT AND VIEW ARCHITECTURE 10

Menus – Keyboard accelerators – rich edit control – toolbars – status bars –reading and writing SDI and MDI documents – splitter window and multiple views – creating DLLs – dialog based applications.

UNIT IV ACTIVEX CONTROLS ,COM AND OLE 9

ActiveX controls Vs. Ordinary Windows Controls – Installing ActiveX controls – Calendar Control – ActiveX control container programming – create ActiveX control at runtime – Component Object Model (COM) – containment and aggregation Vs. inheritance – OLE drag and drop .

UNIT V DATABASE MANAGEMENT CONCEPTS 7

Database Management with Microsoft ODBC – Structured Query Language – MFC ODBC classes – sample database applications – filter and sort strings – DAO concepts – displaying database records in scrolling view – Threading .

TOTAL : 45

REFERENCE BOOKS

1. Charles Petzold, “Windows Programming”, Microsoft press, 1996 (Unit I – Chapter 1-9)
2. David J.Kruglinski, George Shepherd and Scot Wingo, “Programming Visual C++”, Microsoft press, 1999 (Unit II – V)
3. Steve Holtzner, “Visual C++ 6 Programming”, Wiley Dreamtech India Pvt. Ltd., 2003.

INTELLECTUAL PROPERTY RIGHTS (IPR) 3 0 0 100 3

UNIT I **5**

Introduction – Invention and Creativity – Intellectual Property (IP) – Importance – Protection of IPR – Basic types of property (i. Movable Property ii. Immovable Property and iii. Intellectual Property).

UNIT II **10**

IP – Patents – Copyrights and related rights – Trade Marks and rights arising from Trademark registration – Definitions – Industrial Designs and Integrated circuits – Protection of Geographical Indications at national and International levels – Application Procedures.

UNIT III **10**

International convention relating to Intellectual Property – Establishment of WIPO – Mission and Activities – History – General Agreement on Trade and Tariff (GATT).

UNIT IV **10**

Indian Position Vs WTO and Strategies – Indian IPR legislations – commitments to WTO-Patent Ordinance and the Bill – Draft of a national Intellectual Property Policy – Present against unfair competition.

UNIT V **10**

Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and related rights – Trade Marks – Industrial design and Integrated circuits – Geographic indications – Protection against unfair competition.

Total 45

REFERENCE BOOKS

1. Subbaram N.R. " Handbook of Indian Patent Law and Practice ", S. Viswanathan (Printers and Publishers) Pvt. Ltd., 1998.
2. Eli Whitney, United States Patent Number : 72X, Cotton Gin, March 14, 1794.
3. Intellectual Property Today : Volume 8, No. 5, May 2001, [www.iptoday.com].
4. Using the Internet for non-patent prior art searches, Derwent IP Matters, July 2000. [www.ipmatters.net/features/000707_gibbs.html.

INDIAN CONSTITUTION AND SOCIETY 3 0 0 100 3

UNIT I **9**

Historical Background – Constituent Assembly of India – Philosophical foundations of the Indian Constitution – Preamble – Fundamental Rights – Directive Principles of State Policy – Fundamental Duties – Citizenship – Constitutional Remedies for citizens

UNIT II **9**

Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT III **9**

State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts.

UNIT IV **9**

Indian Federal System – Center – State Relations – President's Rule – Constitutional Amendments – Constitutional Functionaries - Assessment of working of the Parliamentary System in India.

UNIT V **9**

Society : Nature, Meaning and definition; Indian Social Structure; Castle, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

REFERENCE BOOKS

1. Durga Das Basu, "Introduction to the Constitution of India", Prentice Hall of India, New Delhi.
2. R.C.Agarwal, "(1997) Indian Political System", S.Chand and Company, New Delhi.
3. Maciver and Page, "Society: An Introduction Analysis", Mac Milan India Ltd., New Delhi.
4. K.L.Sharma, "(1997) Social Stratification in India: Issues and Themes", Jawaharlal Nehru University, New Delhi.
5. Sharma, Brij Kishore, "Introduction to the Constitution of India", Prentice Hall of India, New Delhi.
6. U.R.Gahai, "(1998) Indian Political System", New Academic Publishing House, Jalaendhar.
7. R.N. Sharma, "Indian Social Problems", Media Promoters and Publishers Pvt. Ltd.
8. Yogendra Singh, "(1997) Social Stratification and Charge in India", Manohar, New Delhi.

INFORMATION CODING TECHNIQUES 3 0 0 100 3

UNIT – I INFORMATION ENTROPY FUNDAMENTALS 9

Relation between information and probability - mutual and self information entropy - Shannon's theorem - Code design - Shannon-Fano coding - Huffman coding - Implementation of Huffman code.

UNIT – II DATA AND VOICE CODING 9

Context dependent coding - arithmetic codes - overall efficiency consideration – Voice coding, Delta – Modulation and Adaptive Delta Modulation - linear predictive coding - silence coding - sub-band coding.

UNIT – III IMAGE AND VIDEO COMPRESSION 9

Direct cosine transform -Walsh transform - Hadamard tranform - quantization loss - loss estimation – JPEG components and standards – Interframe coding - motion compensation techniques.

UNIT – IV IMAGE ENCODING 9

Objective and Subjective fidelity criteria - Basic encoding process - The mapping -The quantizer -The coder - differential encoding - Contour encoding - Runlength encoding - Image encoding relative to fidelity criterion - Differential pulse code modulation

UNIT – V ERROR CONTROL CODING 9

Backward error correction - Linear block codes – BCH codes – Golay codes – efficiency of LBC – performance of simple ARQ, go back-n and selective repeat schemes – Forward correction codes – Convolution coding – decoding algorithms – Viterbi decoding – optimum decoding – performance measures.

Lecture 45
Tutorial 15 Total 60

REFERENCE BOOKS:

1. Viterbi, "Information Theory and Coding", McGraw Hill, 1996
2. Proakis, "Digital Communication", McGraw Hill, 1997
3. Sam.K.shanmugam, "Digital and Analog Communication Systems", Johnwiley, 1996
4. Rafael E. Gonzalez, and Paul Wintz, "Digital Image Processing", Addison Wesley Publishing Company, 1987.
5. Anil K Jain, "Fundamentals of Digital Image Processing ", Prentice Hall of India , 1995.