

**ANNA UNIVERSITY CHENNAI:: CHENNAI 600 025**

**CURRICULUM 2004**

**B.TECH. INFORMATION TECHNOLOGY**

**SEMESTER III**

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

<b>Code No.</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>M</b>
<b>THEORY</b>					
MA1201	<a href="#">Mathematics III</a>	3	1	0	100
IT1201	<a href="#">Signals and Systems</a>	3	1	0	100
CS1202	<a href="#">Digital Principles and Systems Design</a>	3	1	0	100
CS1151	<a href="#">Data Structures</a>	3	1	0	100
IT1202	<a href="#">Principles of Communication</a>	3	1	0	100
CS1204	<a href="#">Object Oriented Programming</a>	3	0	0	100
<b>PRACTICAL</b>					
CS1205	<a href="#">Object Oriented Programming Lab</a>	0	0	3	100
CS1206	<a href="#">Digital Lab</a>	0	0	3	100
CS1152	<a href="#">Data Structures Lab</a>	0	0	3	100

**SEMESTER IV**

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

<b>Code No.</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>M</b>
<b>THEORY</b>					
MA1259	<a href="#">Probability and Statistics</a>	3	1	0	100
CS1353	<a href="#">Software Engineering</a>	3	0	0	100
IT1251	<a href="#">Information Coding Techniques</a>	3	0	0	100
CS1251	<a href="#">Computer Architecture</a>	3	1	0	100
IT1252	<a href="#">Digital Signal Processing</a>	3	1	0	100
CS1304	<a href="#">Microprocessors and Microcontrollers</a>	3	1	0	100
<b>PRACTICAL</b>					
IT1253	<a href="#">Software Engineering Lab</a>	0	0	3	100
IT1254	<a href="#">DSP and Communications Systems Lab</a>	0	0	3	100
CS1306	<a href="#">Microprocessors and Microcontrollers Lab</a>	0	0	3	100

## SEMESTER V

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

Code No.	Course Title	L	T	P	M
<b>THEORY</b>					
CY1201	Environmental Science and Engineering	3	0	0	100
CS1402	<a href="#">Object Oriented Analysis and Design</a>	3	1	0	100
CS1252	<a href="#">Operating Systems</a>	3	0	0	100
CS1302	<a href="#">Computer Networks</a>	3	0	0	100
EC1391	<a href="#">Telecommunication Systems</a>	3	0	0	100
CS1301	<a href="#">Database Management Systems</a>	3	1	0	100
GE1302	Communication Skill & Seminar**	0	0	3	-
<b>PRACTICAL</b>					
CS1403	<a href="#">Case Tools Lab</a>	0	0	3	100
CS1254	<a href="#">Operating System Lab (Linux based)</a>	0	0	3	100
CS1307	<a href="#">DBMS Lab</a>	0	0	3	100

## SEMESTER VI

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

Code No.	Course Title	L	T	P	M
<b>THEORY</b>					
MG1351	<a href="#">Principle of Management</a>	3	0	0	100
IT1351	<a href="#">Network Programming and Management</a>	3	0	0	100
IT1352	<a href="#">Cryptography and Network Security</a>	3	1	0	100
CS1253	<a href="#">Visual Programming</a>	3	0	0	100
IT1353	<a href="#">Embedded Systems</a>	3	0	0	100
MA1251	<a href="#">Numerical Methods</a>	3	1	0	100
GE1351	Professional Skill & Seminar**	0	0	3	-
<b>PRACTICAL</b>					
CS1255	<a href="#">Visual Programming Lab</a>	0	0	3	100
CS1305	<a href="#">Network Lab</a>	0	0	3	100

## SEMESTER VII

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

Code No.	Course Title	L	T	P	M
<b>THEORY</b>					
CS1203	<a href="#">System software</a>	3	0	0	100
IT1401	<a href="#">Component Based Technology</a>	3	0	0	100
IT1402	<a href="#">Mobile Computing</a>	3	0	0	100
CS1354	<a href="#">Graphics and Multimedia</a>	3	0	0	100
	Elective I	3	0	0	100

	Elective II	3	0	0	100
<b>PRACTICAL</b>					
IT1403	<a href="#">Software Components Lab</a>	0	0	3	100
CS1355	<a href="#">Graphics and Multimedia Lab</a>	0	0	3	100
CS1207	<a href="#">System software Lab</a>	0	0	3	100

### SEMESTER VIII

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

Code No.	Course Title	L	T	P	M
<b>THEORY</b>					
IT1451	<a href="#">Web Technology</a>	3	1	0	100
	Elective III	3	0	0	100
	Elective IV	3	0	0	100
<b>PRACTICAL</b>					
IT1452	Project Work	0	0	12	200
IT1453	Comprehension**	0	0	2	-

\*\* No Examinations

### LIST OF ELECTIVES FOR B.TECH. INFORMATION TECHNOLOGY

#### SEMESTER VII

Code No.	Course Title	L	T	P	M
CS1001	<a href="#">Resource Management Techniques</a>	3	0	0	100
IT1001	<a href="#">Distributed Systems</a>	3	0	0	100
CS1004	<a href="#">Data Warehousing and Mining</a>	3	0	0	100
MA1256	<a href="#">Discrete Mathematics</a>	3	1	0	100
CS1303	<a href="#">Theory of Computation</a>	3	1	0	100
GE1001	<a href="#">Intellectual Property Rights</a>	3	0	0	100
GE1002	<a href="#">Indian Constitution and Society</a>	3	0	0	100
IT1002	<a href="#">Information System Design</a>	3	0	0	100
CS1015	<a href="#">User Interface Design</a>	3	0	0	100
EC1009	<a href="#">Digital Image Processing</a>	3	0	0	100
IT1003	<a href="#">Financial Accounting &amp; Management</a>	3	0	0	100
EC1015	<a href="#">Satellite Communication</a>	3	0	0	100
CS1005	<a href="#">Advanced Java Programming</a>	3	0	0	100
CS1012	<a href="#">Natural Language Processing</a>	3	0	0	100
IT1004	<a href="#">Business Process Models</a>	3	0	0	100

MG1401	<a href="#">Total Quality Management</a>	3	0	0	100
--------	--	---	---	---	-----

### SEMESTER VIII

Code No.	Course Title	L	T	P	M
CS1352	<a href="#">Principles of Compiler Design</a>	3	0	0	100
BM1007	<a href="#">Medical Informatics</a>	3	0	0	100
IT1005	<a href="#">Bio Informatics</a>	3	0	0	100
IT1006	<a href="#">Enterprise Resource Planning</a>	3	0	0	100
CS1022	<a href="#">Knowledge Based Decision Support Systems</a>	3	0	0	100
IT1007	<a href="#">Electronics Commerce</a>	3	0	0	100
EC1402	<a href="#">Optical Communication</a>	3	0	0	100
CS1010	<a href="#">C# and .NET Framework</a>	3	0	0	100
CS1014	<a href="#">Information Security</a>	3	0	0	100
IT1008	<a href="#">Software Testing</a>	3	0	0	100
IT1009	<a href="#">Web Services</a>	3	0	0	100
IT1010	<a href="#">Mobile Networks</a>	3	0	0	100
IT1011	<a href="#">Digital Asset Management</a>	3	0	0	100
IT1012	<a href="#">Grid computing</a>	3	0	0	100
GE1301	<a href="#">Professional Ethics and Human Values</a>	3	0	0	100

**AIM**

The course aims to develop the skills of the students in the areas of boundary value problems and transform techniques. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

**OBJECTIVES**

At the end of the course the students would

- Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results.
- Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data.
- Have obtained capacity to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them and interpret the results.
- Have grasped the concept of expression of a function, under certain conditions, as a double integral leading to identification of transform pair, and specialization on Fourier transform pair, their properties, the possible special cases with attention to their applications.
- Have learnt the basics of Z – transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z – transform technique bringing out the elegance of the procedure involved.

**UNIT I PARTIAL DIFFERENTIAL EQUATIONS****9 + 3**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types of first order partial differential equations – Lagrange’s linear equation – Linear partial differential equations of second and higher order with constant coefficients.

**UNIT II FOURIER SERIES****9 + 3**

Dirichlet’s conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Complex form of Fourier Series – Parseval’s identify – Harmonic Analysis.

**UNIT III BOUNDARY VALUE PROBLEMS****9 + 3**

Classification of second order quasi linear partial differential equations – Solutions of one dimensional wave equation – One dimensional heat equation – Steady state solution of two-dimensional heat equation (Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

**UNIT IV FOURIER TRANSFORM****9 + 3**

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval’s identity.

**UNIT V Z -TRANSFORM AND DIFFERENCE EQUATIONS****9 + 3**

Z-transform - Elementary properties – Inverse Z – transform – Convolution theorem -Formation of difference equations – Solution of difference equations using Z - transform.

**TUTORIAL****15****TOTAL : 60**

### TEXT BOOKS

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics Volume III", S. Chand & Company Ltd., New Delhi, 1996.
3. Wylie C. Ray and Barrett Louis, C., "Advanced Engineering Mathematics", Sixth Edition, McGraw-Hill, Inc., New York, 1995.

### REFERENCES

1. Andrews, L.A., and Shivamoggi B.K., "Integral Transforms for Engineers and Applied Mathematicians", Macmillan, New York, 1988.
2. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.
3. Churchill, R.V. and Brown, J.W., "Fourier Series and Boundary Value Problems", Fourth Edition, McGraw-Hill Book Co., Singapore, 1987.

## IT1201 SIGNALS AND SYSTEMS

3 1 0 100

### AIM

To understand the concepts of continuous time, discrete time signals and the analysis of continuous and discrete systems.

### OBJECTIVES

- To understand the representation and classification of signals
- To understand the basics of signal analysis using transforms
- To analyze the linear time invariant systems using Fourier, Laplace Transforms and state equations.
- To study the analysis of Discrete Time signals using DFT and Z-transforms.
- To find the frequency response of linear time invariant discrete time system using FFT and Z-transform analysis.

### UNIT I CLASSIFICATION OF SIGNALS AND SYSTEMS 9

Continuous time signals (CT signals), discrete time signals (DT signals) - step, Ramp, Pulse, Impulse, Exponential, Classification of CT and DT signals - periodic and aperiodic, Random signals, CT systems and DT systems, Classification of systems – Linear Time Invariant Systems.

### UNIT II ANALYSIS OF CT SIGNALS 9

Fourier series analysis, Spectrum of CT signals, Fourier Transform and Laplace Transform in Signal Analysis.

### UNIT III LTI-CT SYSTEMS 9

Differential equation, Block diagram representation, Impulse response, Convolution Integral, Frequency response, Fourier Methods and Laplace transforms in analysis, State equations and Matrix.

**UNIT IV ANALYSIS OF DT SIGNALS 9**

Spectrum of DT Signals, Discrete Time Fourier Transform (DTFT), Discrete Fourier Transform (DFT), Properties of Z-transform in signal analysis.

**UNIT V LTI-DT SYSTEMS 9**

Difference equations, Block diagram representation, Impulse response, Convolution SUM, Frequency response, FFT and Z-transform analysis, State variable equation and Matrix.

**TUTORIAL 15**

**TOTAL : 60**

**TEXTBOOK**

1. Alan V. Oppenheim, Alan S. Willsky with S.Hamid Nawab, "Signals & Systems", Pearson / Prentice Hall of India Pvt. Ltd., 2003.

**REFERENCES**

1. K.Lindner, "Signals and Systems", McGraw-Hill International, 1999.
2. Simon Haykin and Barry Van Veen, "Signals and Systems", John Wiley & Sons, Inc., 1999.

**CS1202 DIGITAL PRINCIPLES AND SYSTEM DESIGN 3 1 0 100**

**AIM**

To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design.

**OBJECTIVES**

- To understand different methods used for the simplification of Boolean functions
- To design and implement combinational circuits
- To design and implement synchronous sequential circuits
- To design and implement asynchronous sequential circuits
- To study the fundamentals of VHDL / Verilog HDL

**UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8**

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Logic gates

**UNIT II COMBINATIONAL LOGIC 9**

Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL)

**UNIT III DESIGN WITH MSI DEVICES 8**

Decoders and encoders - Multiplexers and demultiplexers - Memory and programmable logic - HDL for combinational circuits









<b>UNIT I</b>	<b>INTRODUCTION</b>	<b>8</b>
Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.		
<b>UNIT II</b>	<b>PROGRAMMING IN C++</b>	<b>10</b>
Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism.		
<b>UNIT III</b>	<b>FILE HANDLING</b>	<b>9</b>
C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling.		
<b>UNIT IV</b>	<b>JAVA INTRODUCTION</b>	<b>9</b>
An overview of Java, data types, variables and arrays, operators, control statements, classes, objects, methods – Inheritance.		
<b>UNIT V</b>	<b>JAVA PROGRAMMING</b>	<b>9</b>
Packages and Interfaces, Exception handling, Multithreaded programming, Strings, Input /Output		

**TOTAL : 45**

**TEXT BOOKS**

1. K.R.Venugopal, Rajkumar Buyya, T.Ravishankar, “Mastering C++”, TMH, 2003 (Unit I, Unit II, Unit III)
2. Herbert Schildt, “The Java 2 : Complete Reference”, Fourth edition, TMH, 2002 (Unit IV, Unit-V) (Chapters 1-11,13,17)

**REFERENCES**

1. Ira Pohl, “ Object oriented programming using C++”, Pearson Education Asia, 2003
2. Bjarne Stroustrup, "The C++ programming language" Addison Wesley, 2000
3. John R.Hubbard, "Progranning with C++", Schaums outline series, TMH, 2003
4. H.M.Deitel, P.J.Deitel, "Java : how to program", Fifthe edition, Prentice Hall of India private limited.
5. E.Balagurusamy “ Object Oriented Programming with C++”, TMH 2/e

**CS1205                      OBJECT ORIENTED PROGRAMMING LAB                      0 0 3 100**

**C++**

1. Programs Using Functions
  - Functions with default arguments
  - Implementation of Call by Value, Call by Address and Call by Reference
2. Simple Classes for understanding objects, member functions and Constructors
  - Classes with primitive data members
  - Classes with arrays as data members
  - Classes with pointers as data members – String Class
  - Classes with constant data members
  - Classes with static member functions
3. Compile time Polymorphism
  - Operator Overloading including Unary and Binary Operators.
  - Function Overloading

4. Runtime Polymorphism
  - Inheritance
  - Virtual functions
  - Virtual Base Classes
  - Templates
5. File Handling
  - Sequential access
  - Random access

### **JAVA**

6. Simple Java applications
  - for understanding reference to an instance of a class (object), methods
  - Handling Strings in Java
7. Simple Package creation.
  - Developing user defined packages in Java
8. Interfaces
  - Developing user-defined interfaces and implementation
  - Use of predefined interfaces
9. Threading
  - Creation of thread in Java applications
  - Multithreading
10. Exception Handling Mechanism in Java
  - Handling pre-defined exceptions
  - Handling user-defined exceptions

**CS1206**

**DIGITAL LABORATORY**

**3 0 0 100**

### **LIST OF EXPERIMENTS**

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices.
4. Design and implementation of parity generator / checker using basic gates and MSI devices.
5. Design and implementation of magnitude comparator
6. Design and implementation of application using multiplexers
7. Design and implementation of Shift registers
8. Design and implementation of Synchronous and Asynchronous counters
9. Coding combinational circuits using Hardware Description Language (HDL software required)
10. Coding sequential circuits using HDL (HDL software required)

**CS1207**

**SYSTEM SOFTWARE LAB**

**0 0 3 100**

**(Using C or C++)**

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a macro processor.
6. Implement an absolute loader.
7. Implement a relocating loader.
8. Implement pass one of a direct-linking loader.

9. Implement pass two of a direct-linking loader.
10. Implement a simple text editor with features like insertion / deletion of a character, word, sentence.

(For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place)

**MA1259                      PROBABILITY AND STATISTICS**

**3 1 0 100**

**AIM**

The scope of probability and statistics in engineering applications is well known. This course aims at providing the requisite skill to apply the statistical tools in engineering problem.

**OBJECTIVES**

At the end of the course, the students would

- Have a fundamental knowledge of the basic probability concepts.
- Have a well – founded knowledge of standard distributions which can describe real life phenomena.
- Acquire skills in handling situations involving more than one random variable and functions of random variables.
- Be introduced to the notion of sampling distributions and have acquired knowledge of statistical techniques useful in making rational decision in management problems.
- Be exposed to statistical methods designed to contribute to the process of making scientific judgments in the face of uncertainty and variation.

**UNIT I                      PROBABILITY AND RANDOM VARIABLE**

**9 + 3**

Axioms of probability - Conditional probability - Total probability - Bayes theorem - Random variable - Probability mass function - Probability density functions - Properties- Moments - Moment generating functions and their properties.

**UNIT II                      STANDARD DISTRIBUTIONS**

**9 + 3**

Binomial, Poisson, Geometric, Negative Binomial, Uniform, Exponential, Gamma, Weibull 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 - Central limit theorem .

**UNIT IV                      TESTING OF HYPOTHESIS**

**9 + 3**

Sampling distributions – Testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions - Tests for independence of attributes and Goodness of fit.

**UNIT V                      DESIGN OF EXPERIMENTS**

**9 + 3**

Analysis of variance – One way classification – CRD - Two – way classification – RBD - Latin square.

**TUTORIAL****15****TOTAL : 60****TEXT BOOKS**

1. Ross. S., "A first Course in Probability", Fifth Edition, Pearson Education, Delhi 2002. (Chapters 2 to 8)
2. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000. (Chapters 7, 8, 9, 12)

**REFERENCES**

1. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearsons Education, Delhi , 2002.
2. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
3. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition , New Delhi ,1996.

**CS1353****SOFTWARE ENGINEERING****3 0 0 100****AIM**

To introduce the methodologies involved in the development and maintenance of software (i.e) over its entire life cycle.

**OBJECTIVE**

To be aware of

- Different life cycle models
- Requirement dictation process
- Analysis modeling and specification
- Architectural and detailed design methods
- Implementation and testing strategies
- Verification and validation techniques
- Project planning and management
- Use of CASE tools

**UNIT I****SOFTWARE PROCESS****9**

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

**UNIT II****SOFTWARE REQUIREMENTS****9**

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

**UNIT III****DESIGN CONCEPTS AND PRINCIPLES****9**

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

**UNIT IV TESTING 9**

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

**UNIT V SOFTWARE PROJECT MANAGEMENT 9**

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

**TOTAL : 45**

**TEXT BOOKS**

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 5<sup>th</sup> edition, 2001.

**REFERENCES**

1. Ian Sommerville, Software engineering, Pearson education Asia, 6<sup>th</sup> edition, 2000.
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. James F Peters and Witold Pedrycz, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
4. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.

**IT1251 INFORMATION CODING TECHNIQUES 3 0 0 100**

**AIM**

To introduce the fundamental concepts of information theory: data compaction, data compression, data transmission, error detection and correction.

**OBJECTIVES**

- To have a complete understanding of error-control coding.
- To understand encoding and decoding of digital data streams.
- To introduce methods for the generation of these codes and their decoding techniques.
- To have a detailed knowledge of compression and decompression techniques.
- To introduce the concepts of multimedia communication.

**UNIT I INFORMATION ENTROPY FUNDAMENTALS 9**

Uncertainty, Information and Entropy – Source coding Theorem – Huffman coding –Shannon Fano coding – Discrete Memory less channels – channel capacity – channel coding Theorem – Channel capacity Theorem.

<b>UNIT II</b>	<b>DATA AND VOICE CODING</b>	<b>9</b>
Differential Pulse code Modulation – Adaptive Differential Pulse Code Modulation – Adaptive subband coding – Delta Modulation – Adaptive Delta Modulation – Coding of speech signal at low bit rates (Vocoders, LPC).		
<b>UNIT III</b>	<b>ERROR CONTROL CODING</b>	<b>9</b>
Linear Block codes – Syndrome Decoding – Minimum distance consideration – cyclic codes – Generator Polynomial – Parity check polynomial – Encoder for cyclic codes – calculation of syndrome – Convolutional codes.		
<b>UNIT IV</b>	<b>COMPRESSION TECHNIQUES</b>	<b>9</b>
Principles – Text compression – Static Huffman Coding – Dynamic Huffman coding – Arithmetic coding – Image Compression – Graphics Interchange format – Tagged Image File Format – Digitized documents – Introduction to JPEG standards.		
<b>UNIT V</b>	<b>AUDIO AND VIDEO CODING</b>	<b>9</b>
Linear Predictive coding – code excited LPC – Perceptual coding, MPEG audio coders – Dolby audio coders – Video compression – Principles – Introduction to H.261 & MPEG Video standards.		

**TOTAL : 45**

**TEXTBOOKS**

1. Simon Haykin, “Communication Systems”, John Wiley and Sons, 4<sup>th</sup> Edition, 2001.
2. Fred Halsall, “Multimedia Communications, Applications Networks Protocols and Standards”, Pearson Education, Asia 2002; Chapters: 3,4,5.

**REFERENCES**

1. Mark Nelson, “Data Compression Book”, BPB Publication 1992.
2. Watkinson J, “Compression in Video and Audio”, Focal Press, London, 1995.

**CS1251**                      **COMPUTER ARCHITECTURE**    **3 1 0 100**

**AIM**

*To discuss the basic structure of a digital computer and to study in detail the organization of the Control unit, the Arithmetic and Logical unit, the Memory unit and the I/O unit.*

**OBJECTIVES**

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study in detail the different types of control and the concept of pipelining.
- To study the hierarchical memory system including cache memories and virtual memory.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.



<b>UNIT I</b>	<b>BASIC STRUCTURE OF COMPUTERS</b>	<b>10</b>
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.		
<b>UNIT II</b>	<b>ARITHMETIC UNIT</b>	<b>8</b>
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.		
<b>UNIT III</b>	<b>BASIC PROCESSING UNIT</b>	<b>9</b>
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.		
<b>UNIT IV</b>	<b>MEMORY SYSTEM</b>	<b>9</b>
Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.		
<b>UNIT V</b>	<b>I/O ORGANIZATION</b>	<b>9</b>
Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).		
<b>TUTORIAL</b>		<b>15</b>
		<b>TOTAL : 60</b>

#### **TEXT BOOKS**

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

#### **REFERENCES**

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

### **IT1252                      DIGITAL SIGNAL PROCESSING                      3 1 0 100**

#### **AIM**

To review signals and systems, study DFT and FFT, discuss the design of IIR & FIR filters and study typical applications of digital signal processing.

#### **OBJECTIVES**

- To have an overview of signals and systems.
- To study DFT & FFT
- To study the design of IIR filters.
- To study the design of FIR filters.
- To study the effect of finite word lengths & applications of DSP

<b>UNIT I</b>	<b>SIGNALS AND SYSTEMS</b>	<b>9</b>
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.		
<b>UNIT II</b>	<b>FAST FOURIER TRANSFORMS</b>	<b>9</b>
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.		
<b>UNIT III</b>	<b>IIR FILTER DESIGN</b>	<b>9</b>
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.		
<b>UNIT IV</b>	<b>FIR FILTER DESIGN</b>	<b>9</b>
Symmetric & Antisymmetric FIR filters – Linear phase filter – Windowing technique – Rectangular, Kaiser windows – Frequency sampling techniques – Structure for FIR systems.		
<b>UNIT V</b>	<b>FINITE WORD LENGTH EFFECTS</b>	<b>9</b>
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.		
<b>TUTORIAL</b>		<b>15</b>

**TOTAL : 60**

**TEXT BOOK**

1. John G Proakis and Dimtris G Manolakis, “Digital Signal Processing Principles, Algorithms and Application”, PHI/Pearson Education, 2000, 3<sup>rd</sup> Edition.

**REFERENCES**

1. Alan V Oppenheim, Ronald W Schafer and John R Buck, “Discrete Time Signal Processing”, PHI/Pearson Education, 2000, 2<sup>nd</sup> Edition.
2. Johny R.Johnson, “Introduction to Digital Signal Processing”, Prentice Hall of India/Pearson Education, 2002.
3. Sanjit K.Mitra, “Digital Signal Processing: A Computer – Based Approach”, Tata McGraw-Hill, 2001, Second Edition.

**CS1304                      MICROPROCESSORS AND MICROCONTROLLERS                      3 1 0 100**

**AIM**

To have an in depth knowledge of the architecture and programming of 8-bit and 16-bit Microprocessors, Microcontrollers and to study how to interface various peripheral devices with them.

**OBJECTIVE**

- To study the architecture and Instruction set of 8085 and 8086
- To develop assembly language programs in 8085 and 8086.
- To design and understand multiprocessor configurations

- To study different peripheral devices and their interfacing to 8085/8086.
- To study the architecture and programming of 8051 microcontroller.

**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 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**

**TEXT BOOKS**

1. Ramesh S.Gaonkar, “Microprocessor - Architecture, Programming and Applications with the 8085”, Penram International publishing private limited, fifth edition.  
(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. (UNITS 2 to 5: – Chapters 1-6, 7.1-7.3, 8, 16)

**REFERENCES**

1. Douglas V.Hall, “Microprocessors and Interfacing: Programming and Hardware”, TMH, Third edition
2. Yu-cheng Liu, Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design”, PHI 2003
3. Mohamed Ali Mazidi, Janice Gillispie Mazidi, “The 8051 microcontroller and embedded systems”, Pearson education, 2004.

**IT1253 SOFTWARE ENGINEERING LAB 0 0 3 100**

Develop two or three of the following applications using the software engineering methodologies given below using C/C++ as frontend and MS-ACCESS as Backend.

- Requirements Analysis
- Design Concepts
- Function Point Analysis
- Implementation
- Software Testing Techniques
- Error Tracking

Suggested List of Applications:

1. Library Management System
2. Bank Management System
3. Inventory System
4. Software for a Game
5. Text Editor
6. Natural Language Based Grammar Checker
7. Airline Reservation System
8. Online Survey
9. Financial Accounting System
10. Graphics Toolkit

**IT1254                      DSP AND COMMUNICATION SYSTEMS LAB                      0 0 3**  
**100**

1. Generation and detection of Amplitude Modulation
2. Generation of Frequency modulation and its detection
3. Generation and detection of PAM
4. Generation of BFSK and its detection
5. Pseudo Random Noise sequence generation with digital IC's.
6. Generation of i/p Signals.
7. Analysis of linear system [with convolution and deconvolution operation]
8. FIR filter design. [any one Technique]
9. IIR filter design [any one Technique]
10. Implementation of FFT, Interpolation and decimation
11. Simulation of DS spread spectrum [Experiments 6 to 11 are to be implemented with MATLAB]

**CS1306                      MICROPROCESSORS AND MICROCONTROLLERS LAB                      0 0 3 100**

**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).

**GE1301                      PROFESSIONAL ETHICS AND HUMAN VALUES                      3 0 0 100**

**OBJECTIVE**

- To create an awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values and Loyalty
- To appreciate the rights of Others

**1.                      HUMAN VALUES                      10**

Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality

<b>2. ENGINEERING ETHICS</b>	<b>9</b>
Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.	
<b>3. ENGINEERING AS SOCIAL EXPERIMENTATION</b>	<b>9</b>
Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study	
<b>4. SAFETY, RESPONSIBILITIES AND RIGHTS</b>	<b>9</b>
Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.	
<b>5. GLOBAL ISSUES</b>	<b>8</b>
Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers(India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers(IETE),India, etc.	
<b>TUTORIAL</b>	<b>15</b>
	<b>TOTAL : 60</b>

#### **TEXT BOOKS**

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

#### **REFERENCES**

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint)
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

**CS1402                      OBJECT ORIENTED ANALYSIS AND DESIGN                      3 1 0 100**

**AIM**

To understand the concepts of object oriented analysis and design.

## **OBJECTIVES**

- To understand the object oriented life cycle.
- To know how to identify objects, relationships, services and attributes through UML.
- To understand the use-case diagrams.
- To know the Object Oriented Design process.
- To know about software quality and usability.

### **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**

**TOTAL : 45+15 HRS**

#### **TEXT BOOKS**

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999 (Unit I, III, IV, V).
2. Martin Fowler, “UML Distilled”, Second Edition, PHI/Pearson Education, 2002. (UNIT II)

#### **REFERENCE BOOKS**

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.

**AIM**

To have a thorough knowledge of processes, scheduling concepts, memory management, I/O and file systems in an operating system.

**OBJECTIVES**

- To have an overview of different types of operating systems
- To know the components of an operating system.
- To have a thorough knowledge of process management
- To have a thorough knowledge of storage management
- To know the concepts of I/O and file systems.

**UNIT I****9**

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****9**

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****9**

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****9**

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****9**

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

**TOTAL : 45****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. 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.

**EC1391 TELECOMMUNICATION SYSTEMS 3 0 0 100**

**AIM**

**To gain knowledge about microwave, satellite, optical, telephone and cellular communication systems.**

**OBJECTIVES**

- To have knowledge about characteristics of Transmission and microwave devices.
- To study about the fundamentals of satellite communication
- To gain brief knowledge about optical communication
- To gain knowledge about optical communication
- To gain knowledge about advances in Telephone systems
- To understand the essentials of cellular communication systems.

**UNIT I METHODS OF COMMUNICATION 9**

Transmission lines – Types and Characteristics, Antenna Fundamentals – Different types of antennas & their Characteristics, Radio Frequency wave propagation- Microwave –Principles, Devices (Reflex Klystron, Magnetron, TWT)-(Principles Only) Radar - Pulsed Radar - CW Radar (Principles and Block Diagram Only).

**UNIT II INTRODUCTION TO SATELLITE COMMUNICATIONS 9**

Satellite orbits- Satellite communication systems –Earth stations- Applications: Surveillance, Navigation, Mobile Communication, TV Broadcast, Satellite Radio, Satellite Telephone-The Internet.

**UNIT III INTRODUCTION TO FIBER OPTIC COMMUNICATION 9**

Light wave communication systems – Fiber structure and function types of Fiber – Optical Transmitter & Receiver –Fiber optic Data communication systems

**UNIT IV TELEPHONE SYSTEM AND ITS APPLICATION 9**

Telephones –Telephone system- Facsimile- Cellular telephone system-Paging system –Integrated services Digital Networks (ISDN)

**UNIT V CELLULAR RADIO 9**

Citizen's band Radio, Cordless Telephone, Improved Mobile Telephone service (IMTS), Introduction to Advanced Mobile Phone Service (AMPS), GSM – RF channels and time slots – Voice transmission – Frequency Hopping - Subscriber ID module – GSM Privacy and Security – IS-95 CDMA PCS – Channels – Forward Channel – Reverse Channel – Voice Coding – Power Control – Hand-off and CDMA Security.

**TOTAL : 45**

**TEXT BOOKS**

1. Louis.E.Frenzel, "Communication Electronics – Principles and Application", 3<sup>rd</sup> Editions, Tata McGraw-Hill, 2002 (Units I to IV)
2. Roy Blake, "Wireless Communication Technology", Thomson Delmar

Learning, Second Reprint 2002. (UNIT V Chapters: 10, 11)

## REFERENCES

1. Wayne Tomasi, "Electronic Communication systems" 4<sup>th</sup> Edition, Pearson Education, 2001.
2. Marin Cole, "Introduction to Telecommunications –Voice, Data and Internet", Pearson Education, 2001.

**CS1301            DATABASE MANAGEMENT SYSTEMS**

**3 1 0 100**

## *AIM*

**To provide a strong foundation in database technology and an introduction to the current trends in this field.**

## OBJECTIVES

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the emerging trends in the area of distributed DB- OO DB- Data mining and Data Warehousing and XML.

## **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.

**TEXT BOOKS**

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.

**CS1403 CASE TOOLS LAB****0 0 3 100**

Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.

1. Program Analysis and Project Planning.  
Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
2. Software requirement Analysis  
Describe the individual Phases / Modules of the project, Identify deliverables.
3. 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.
4. Software Development and Debugging
5. 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

**CS1254 OPERATING SYSTEM LAB (Linux based)****0 0 3 100**

(Implement the following on LINUX platform. Use C for high level language implementation)

1. Shell programming
  - command syntax
  - write simple functions
  - basic tests
2. Shell programming
  - loops
  - patterns
  - expansions
  - substitutions
3. Write programs using the following system calls of UNIX operating system:  
fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. Write C programs to simulate UNIX commands like ls, grep, etc.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
7. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
8. Implement the Producer – Consumer problem using semaphores.
9. Implement some memory management schemes – I for eg  
Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space.
10. Implement some memory management schemes – II for eg  
When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

**CS1307 DATABASE MANAGEMENT SYSTEMS LAB****0 0 3 100****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.

**MG1351 PRINCIPLES OF MANAGEMENT****3 0 0 100****OBJECTIVE**

Knowledge on the principles of management is essential for all kinds of people in all kinds of organizations. After studying this course, students will be able to have a clear understanding of the managerial functions like planning, organizing, staffing, leading and controlling. Students will also gain some basic knowledge on international aspect of management.

<b>1. HISTORICAL DEVELOPMENT</b>	<b>9</b>
Definition of Management – Science or Art – Management and Administration – Development of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organisation.	
<b>2. PLANNING</b>	<b>9</b>
Nature & Purpose – Steps involved in Planning – Objectives – Setting Objectives – Process of Managing by Objectives – Strategies, Policies & Planning Premises- Forecasting – Decision-making.	
<b>3. ORGANISING</b>	<b>9</b>
Nature and Purpose – Formal and informal organization – Organization Chart – Structure and Process – Departmentation by difference strategies – Line and Staff authority – Benefits and Limitations – De-Centralization and Delegation of Authority – Staffing – Selection Process - Techniques – HRD – Managerial Effectiveness.	
<b>4. DIRECTING</b>	<b>9</b>
Scope – Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership Motivation – Hierarchy of needs – Motivation theories – Motivational Techniques – Job Enrichment – Communication – Process of Communication – Barriers and Breakdown – Effective Communication – Electronic media in Communication.	
<b>5. CONTROLLING</b>	<b>9</b>
System and process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology in Controlling – Use of computers in handling the information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global theory of Management.	

**TOTAL : 45**

**TEXT BOOKS**

1. Harold Kooritz & Heinz Weihrich “Essentials of Management”, Tata McGraw-Hill, 1998.
2. Joseph L Massie “Essentials of Management”, Prentice Hall of India, (Pearson) Fourth Edition, 2003.

**REFERENCES**

1. Tripathy PC And Reddy PN, “ Principles of Management”, Tata McGraw-Hill, 1999.
2. Decenzo David, Robbin Stephen A, ”Personnel and Human Reasons Management”, Prentice Hall of India, 1996
3. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
4. Fraidoon Mazda, “Engineering Management”, Addison Wesley,-2000.

**AIM**

To enable the students to develop the necessary skills for developing robust & scalable network applications and to build necessary basic knowledge for managing networks.

**OBJECTIVES**

- To learn the basics of socket programming using TCP Sockets.
- To learn basics of UDP sockets.
- To develop knowledge of threads for developing high performance scalable applications.
- To learn about raw sockets.
- To understand simple network management protocols & practical issues.

**UNIT I ELEMENTARY TCP SOCKETS 9**

Introduction to Socket Programming – Overview of TCP/IP Protocols –Introduction to Sockets – Socket address Structures – Byte ordering functions – address conversion functions – Elementary TCP Sockets – socket, connect, bind, listen, accept, read, write, close functions – Iterative Server – Concurrent Server.

**UNIT II APPLICATION DEVELOPMENT 9**

TCP Echo Server – TCP Echo Client – Posix Signal handling – Server with multiple clients – boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown – I/O multiplexing – I/O Models – select function – shutdown function – TCP echo Server (with multiplexing) – poll function – TCP echo Client (with Multiplexing)

**UNIT III SOCKET OPTIONS, ELEMENTRY UDP SOCKETS 9**

Socket options – getsockopt and setsockopt functions – generic socket options – IP socket options – ICMP socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – Ipv6 support in DNS – gethostbyadr function – getservbyname and getservbyport functions.

**UNIT IV ADVANCED SOCKETS 9**

Ipv4 and Ipv6 interoperability – threaded servers – thread creation and termination – TCP echo server using threads – Mutexes – condition variables – raw sockets – raw socket creation – raw socket output – raw socket input – ping program – trace route program.

**UNIT V SIMPLE NETWORK MANAGEMENT 9**

SNMP network management concepts – SNMP management information – standard MIB's – SNMPv1 protocol and Practical issues – introduction to RMON, SNMPv2 and SNMPv3.

**TOTAL : 45 HRS**

**TEXT BOOKS**

1. W. Richard Stevens, "UNIX NETWORK PROGRAMMING Vol-I" Second Edition, PHI / Pearson Education, 1998. (Units – I, II, III & IV.) (Chapter – 1-10, 23, 25)
2. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", Third Edition, Addison Wesley, 1999. (Unit - V) (Chapter – 4-7)

**REFERENCE**

1. D.E. Comer, "Internetworking with TCP/IP Vol- III", (BSD Sockets Version), second Edition, PHI, 2003.

**IT1352 CRYPTOGRAPHY AND NETWORK SECURITY 3 1 0 100**

### **AIM**

To understand the principles of encryption algorithms; conventional and public key cryptography. To have a detailed knowledge about authentication, hash functions and application level security mechanisms.

### **OBJECTIVES**

- To know the methods of conventional encryption.
- To understand the concepts of public key encryption and number theory
- To understand authentication and Hash functions.
- To know the network security tools and applications.
- To understand the system level security used.

**UNIT I INTRODUCTION 10**

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 10**

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 9**

**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 8**

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

**UNIT V SYSTEM LEVEL SECURITY 8**

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

**TUTORIAL 15**

**TOTAL : 60**

**TEXT BOOK**







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**

**9**

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.

**TOTAL : 45**

#### **TEXTBOOKS**

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.

#### **MA1251 NUMERICAL METHODS**

**3 1 0 100**

#### **AIM**

With the present development of the computer technology, it is necessary to develop efficient algorithms for solving problems in science, engineering and technology. This course gives a complete procedure for solving different kinds of problems occur in engineering numerically.

#### **OBJECTIVES**

At the end of the course, the students would be acquainted with the basic concepts in numerical methods and their uses are summarized as follows:

- The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigenvalue problem of a matrix can be obtained numerically where analytical methods fail to give solution.
- When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.
- The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information.
- Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations. The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.

**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-Jordan methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods- Inverse of a matrix by Gauss Jordan 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**

**TEXT BOOKS**

1. Gerald, C.F, and Wheatley, P.O, “Applied Numerical Analysis”, Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Balagurusamy, E., “Numerical Methods”, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 1999.

**REFERENCES**

1. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., “Numerical Methods”, S.Chand Co. Ltd., New Delhi, 2003.
2. Burden, R.L and Faires, T.D., “Numerical Analysis”, Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.

**CS1255**

**VISUAL PROGRAMMING LAB**

**0 0 3 100**

**LIST OF EXPERIMENTS**

**Windows SDK / Visual C++**

1. Writing code for keyboard and mouse events.
2. Dialog Based applications
3. Creating MDI applications

**Visual C++**

4. Threads
5. Document view Architecture, Serialization
6. Dynamic controls
7. Menu, Accelerator, Tool tip, Tool bar
8. Creating DLLs and using them
9. Data access through ODBC
10. Creating ActiveX control and using it

**CS1305**

**NETWORK LAB**

**0 0 3 100**

(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 NS2.
10. Study of Glomosim / OPNET.

**MG1401**

**TOTAL QUALITY MANAGEMENT**

**3 0 0 100**

**OBJECTIVE**

- To understand the Total Quality Management concept and principles and the various tools available to achieve Total Quality Management.
- To understand the statistical approach for quality control.
- To create an awareness about the ISO and QS certification process and its need for the industries.

**1. INTRODUCTION**

**9**

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

**2. TQM PRINCIPLES**

**9**

Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure.

**3. STATISTICAL PROCESS CONTROL (SPC) 9**

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

**4. TQM TOOLS 9**

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

**5. QUALITY SYSTEMS 9**

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 – Concept, Requirements and Benefits.

**TOTAL : 45**

**TEXT BOOK**

1. Dale H.Besterfield, et al., Total Quality Management, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.

**REFERENCES**

1. James R.Evans & William M.Lindsay, The Management and Control of Quality, (5<sup>th</sup> Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. “Total Quality Management, McGraw-Hill, 1991.
3. Oakland.J.S. “Total Quality Management Butterworth – Heinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International 1996.
5. Zeiri. “Total Quality Management for Engineers Wood Head Publishers, 1991.

**IT1401 COMPONENT BASED TECHNOLOGY 3 0 0 100**

**AIM**

To introduce different software components and their application.

**OBJECTIVE**

- Introduces in depth JAVA, Corba and .Net Components
- Deals with Fundamental properties of components, technology and architecture and middleware.
- Component Frameworks and Development are covered indepth.

**UNIT I INTRODUCTION 9**

Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware



Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

**UNIT II TELECOMMUNICATION NETWORKS 11**

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

**UNIT III WIRELESS LAN 9**

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth.

**UNIT IV MOBILE NETWORK LAYER 9**

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

**UNIT V TRANSPORT AND APPLICATION LAYERS 7**

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

**TOTAL : 45**

**TEXT BOOKS**

1. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003. (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7.Unit IV Chap 8- Unit V Chap 9&10.)
2. William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)

**REFERENCES**

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.
3. Hazysztof Wesolowshi, “Mobile Communication Systems”, John Wiley and Sons Ltd, 2002.

**CS1354 GRAPHICS AND MULTIMEDIA 3 0 0 100**

**AIM**

To impart the fundamental concepts of Computer Graphics and Multimedia.

**OBJECTIVES**

- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop their creativity

**UNIT I OUTPUT PRIMITIVES 9**

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

**UNIT II THREE-DIMENSIONAL CONCEPTS 9**

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







Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and post request – redirecting request – multi-tier applications – JSP – Overview – Objects – scripting – Standard Actions – Directives.

**TUTORIAL**

**15**

**TOTAL : 60**

**TEXT BOOK**

1. Deitel & Deitel, Goldberg, “Internet and world wide web – How to Program”, Pearson Education Asia, 2001.

**REFERENCES**

1. Eric Ladd, Jim O’ Donnel, “Using HTML 4, XML and JAVA”, Prentice Hall of India – QUE, 1999.
2. Aferganatel, “Web Programming: Desktop Management”, PHI, 2004.
3. Rajkamal, “Web Technology”, Tata McGraw-Hill, 2001.



<b>UNIT I</b>	<b>INTRODUCTION</b>	<b>9</b>
Introduction to Distributed systems-examples of distributed systems, challenges-architectural models-fundamental models - Introduction to interprocess communications-external data representation and marshalling- client server communication-group communication – Case study: IPC in UNIX		
<b>UNIT II</b>	<b>DISTRIBUTED OBJECTS AND FILE SYSTEM</b>	<b>9</b>
Introduction - Communication between distributed objects - Remote procedure call - Events and notifications - Java RMI case Study - Introduction to DFS - File service architecture - Sun network file system - Introduction to Name Services- Name services and DNS - Directory and directory services		
<b>UNIT III</b>	<b>DISTRIBUTED OPERATING SYSTEM SUPPORT</b>	<b>11</b>
The operating system layer – Protection - Process and threads - Communication and invocation - Operating system architecture - Introduction to time and global states - Clocks, Events and Process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Distributed debugging – Distributed mutual exclusion.		
<b>UNIT IV</b>	<b>TRANSACTION AND CONCURRENCY CONTROL – DISTRIBUTED TRANSACTIONS</b>	<b>8</b>
Transactions – Nested transaction – Locks - Optimistic concurrency control - Timestamp ordering - Comparison of methods for concurrency control - Introduction to distributed transactions - Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery		
<b>UNIT –V</b>	<b>SECURITY AND REPLICATION</b>	<b>8</b>
Overview of security techniques - Cryptographic algorithms – Digital signatures - Cryptography pragmatics – Replication - System model and group communications – Fault tolerant services – Highly available services – Transactions with replicated data		

**TOTAL : 45**

**TEXT BOOK**

1. George Coulouris, Jean Dollimore, Tim Kindberg “Distributed Systems Concepts and Design” Third Edition – 2002- Pearson Education Asia.

**REFERENCES**

1. A.S.Tanenbaum, M.Van Steen “ Distributed Systems” Pearson Education 2004
2. Mukesh Singhal, Ohio State University, Columbus “Advanced Concepts In Operating Systems” McGraw-Hill Series in Computer Science, 1994.

**AIM**

To serve as an introductory course to under graduate students with an emphasis on the design aspects of Data Mining and Data Warehousing

**OBJECTIVE**

This course has been designed with the following objectives:

- To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with.
- To introduce the concept of data warehousing with special emphasis on architecture and design.

**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****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", 3<sup>rd</sup> Edition, Wiley, 2003.
5. Alex Bezon, Stephen J.Smith, "Data Warehousing, Data Mining & OLAP", McGraw-Hill Edition, 2001.

6. Paulraj Ponniah, "Data Warehousing Fundamentals", Wiley-Interscience Publication, 2003.

**MA1256**

**DISCRETE MATHEMATICS**

**3 1 0 100**

**AIM**

To extend student's mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

**OBJECTIVES**

At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program.
- Have gained knowledge which has application in expert system, in data base and a basic for the prolog language.
- Have an understanding in identifying patterns on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be exposed to concepts and properties of algebraic structures such as semigroups, monoids and groups.

**UNIT I**

**PROPOSITIONAL CALCULUS**

**10 + 3**

Propositions – Logical connectives – Compound propositions – Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences and implications – DeMorgan's Laws - Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments - Validity of arguments.

**UNIT II**

**PREDICATE CALCULUS**

**9 + 3**

Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements – Theory of inference – The rules of universal specification and generalization – Validity of arguments.

**UNIT III**

**SET THEORY**

**10 + 3**

Basic concepts – Notations – Subset – Algebra of sets – The power set – Ordered pairs and Cartesian product – Relations on sets –Types of relations and their properties – Relational matrix and the graph of a relation – Partitions – Equivalence relations – Partial ordering – Poset – Hasse diagram – Lattices and their properties – Sublattices – Boolean algebra – Homomorphism.

**UNIT IV**

**FUNCTIONS**

**7 + 3**

Definitions of functions – Classification of functions –Type of functions - Examples – Composition of functions – Inverse functions – Binary and n-ary operations – Characteristic function of a set – Hashing functions – Recursive functions – Permutation functions.

**UNIT V**

**GROUPS**

**9 + 3**

Algebraic systems – Definitions – Examples – Properties – Semigroups – Monoids – Homomorphism – Sub semigroups and Submonoids - Cosets and Lagrange's theorem – Normal subgroups – Normal

algebraic system with two binary operations - Codes and group codes – Basic notions of error correction - Error recovery in group codes.

**TUTORIAL**

**15**

**TOTAL : 60**

**TEXT BOOKS**

1. Trembly J.P and Manohar R, “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 2003.
2. Ralph. P. Grimaldi, “Discrete and Combinatorial Mathematics: An Applied Introduction”, Fourth Edition, Pearson Education Asia, Delhi, 2002.

**REFERENCES**

1. Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, “Discrete Mathematical Structures”, Fourth Indian reprint, Pearson Education Pvt Ltd., New Delhi, 2003.
2. Kenneth H.Rosen, “Discrete Mathematics and its Applications”, Fifth Edition, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2003.
3. Richard Johnsonbaugh, “Discrete Mathematics”, Fifth Edition, Pearson Education Asia, New Delhi, 2002.

**CS1303 THEORY OF COMPUTATION**

**3 1 0 100**

**AIM**

To have an introductory knowledge of automata, formal language theory and computability.

**OBJECTIVES**

- To have an understanding of finite state and pushdown automata.
- To have a knowledge of regular languages and context free languages.
- To know the relation between regular language, context free language and corresponding recognizers.
- To study the Turing machine and classes of problems.

**UNIT I AUTOMATA**

**9**

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**

**9**

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**

**9**

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**

**9**

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

**UNIT V UNDECIDABILITY**

**9**

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.

**TUTORIAL**

**15**

**TOTAL : 60**

**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.

**IT1002**

**INFORMATION SYSTEMS DESIGN**

**3 0 0 100**

**AIM**

To understand the design, development and management of information systems.

**OBJECTIVES**

- To know the basics of managing the digital firm.
- To understand the design, development and maintenance of information systems.
- To understand basic issues in knowledge management and information systems.
- To know the ethical and security issues in information systems.

**UNIT I**

**MANAGING THE DIGITAL FIRM**

**9**

Why information systems – contemporary approaches to information systems – new role of information systems- major types of systems in organizations – systems from a functional perspective – enterprise applications – organizations and information systems – managers decision making and information systems – information systems and business strategy.

**UNIT II**

**DESIGNING INFORMATION SYSTEMS**

**9**

Systems as planned organizational change – business process re-engineering and process improvement – overview of systems development – alternate system – Building approaches – Understanding the business value of Information Systems - The importance of change management in information system success and failure – Managing Implementation.

**UNIT III**

**DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS**

**9**

Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off-the shelf software packages – Outsourcing – Comparison of different methodologies.

**UNIT IV**

**KNOWLEDGE MANAGEMENT, ETHICS AND SECURITY**

**9**

Knowledge Management in the organization – Information and Knowledge base systems – Decision - support systems – Understanding ethical and Social issues packed to systems – Ethics in an Information society – The moral dimensions of Information Systems – System vulnerability and abuse – Creating a control environment – Ensuring System Quality.

**UNIT V**

**INFORMATION ARCHITECTURE**

**9**



Defining Information Architecture – why Information Architecture matters – Practicing Information Architecture in the Real world – Information Ecologies – User needs and Behavior – The anatomy of Information Architecture – Organizing Systems – Search Systems.

**TOTAL : 45**

**TEXT BOOKS**

1. Lauaon Kenneth & Landon Jane, "Management Information Systems: Managing the Digital firm", Eighth edition, PHI, 2004.[Unit – 1, 2, 4]
2. Uma G. Gupta, "Management Information Systems – A Management Prespective", Galgotia publications Pvt., Ltd., 1998. [Unit – 3].
3. Louis Rosenfel and Peter Morville, "Information Architecture for the World wide Web", O'Reilly Associates, 2002. [Unit – 5].

**REFERENCES**

1. Steven Alter, "Information Systems – A Management Perspective", Pearson Education, 2001.
2. Uma Gupta, "Information Systems – Success in 21<sup>st</sup> Century", Prentice Hall of India, 2000.
3. Robert G. Murdick, Joel E. Ross and James R. Claggett, "Information Systems for Modern Management", PHI, 1994.

**CS1015**

**USER INTERFACE DESIGN**

**3 0 0 100**

**AIM**

To implement the basics and in-depth knowledge about UID. It enables the students to take up the design the user interface, design, menu creation and windows creation and connection between menu and windows.

**OBJECTIVES**

- To study the concept of menus, windows, interfaces.
- To study about business functions.
- To study the characteristics and components of windows.
- To study the various controls for the windows.
- To study about various problems in windows design with color, text, graphics.
- To study the testing methods

**UNIT I**

**8**

Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles.

**UNIT II**

**10**

User interface design process- obstacles-usability-human characteristics in design - Human interaction speed-business functions-requirement analysis-Direct-Indirect methods-basic business functions-Design standards-system timings - Human consideration in screen design - structures of menus - functions of menus-contents of menu-formatting -phrasing the menu - selecting menu choice-navigating menus-graphical menus.

**UNIT III****9**

Windows: Characteristics-components-presentation styles-types-managements-organizations-operations-web systems-device-based controls: characteristics-Screen -based controls: operate control - text boxes-selection control-combination control-custom control-presentation control.

**UNIT IV****9**

Text for web pages - effective feedback-guidance & assistance-Internationalization-accessibility-Icons-Image-Multimedia -coloring.

**UNIT V****9**

Windows layout-test :prototypes - kinds of tests - retest - Information search - visualization - Hypermedia - www - Software tools.

**TOTAL : 45****TEXT BOOK**

1. Wilbent. O. Galitz ,“The Essential Guide to User Interface Design”, John Wiley& Sons, 2001.

**REFERENCES**

1. Ben Sheiderman, “Design the User Interface”, Pearson Education, 1998.
2. Alan Cooper, “The Essential of User Interface Design”, Wiley – Dream Tech Ltd., 2002.

**EC1009****DIGITAL IMAGE PROCESSING****3 0 0 100****AIM**

To introduce the student to various image processing techniques.

**OBJECTIVES**

- To study the image fundamentals and mathematical transforms necessary for image processing.
- To study the image enhancement techniques
- To study image restoration procedures.
- To study the image compression procedures.
- To study the image segmentation and representation techniques.

**UNIT I****DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS****9**

Elements of visual perception – Image sampling and quantization Basic relationship between pixels – Basic geometric transformations-Introduction to Fourier Transform and DFT – Properties of 2D Fourier Transform – FFT – Separable Image Transforms -Walsh – Hadamard – Discrete Cosine Transform, Haar, Slant – Karhunen – Loeve transforms.

**UNIT II****IMAGE ENHANCEMENT TECHNIQUES:****9**

Spatial Domain methods: Basic grey level transformation – Histogram equalization – Image subtraction – Image averaging –Spatial filtering: Smoothing, sharpening filters – Laplacian filters – Frequency domain filters : Smoothing – Sharpening filters – Homomorphic filtering.

**UNIT III IMAGE RESTORATION: 9**  
Model of Image Degradation/restoration process – Noise models – Inverse filtering -Least mean square filtering – Constrained least mean square filtering – Blind image restoration – Pseudo inverse – Singular value decomposition.

**UNIT IV IMAGE COMPRESSION 9**  
Lossless compression: Variable length coding – LZW coding – Bit plane coding- predictive coding-DPCM. Lossy Compression: Transform coding – Wavelet coding – Basics of Image compression standards: JPEG, MPEG,Basics of Vector quantization.

**UNIT V IMAGE SEGMENTATION AND REPRESENTATION 9**  
Edge detection – Thresholding - Region Based segmentation – Boundary representation: chain codes- Polygonal approximation – Boundary segments – boundary descriptors: Simple descriptors-Fourier descriptors - Regional descriptors –Simple descriptors- Texture

**TOTAL : 45**

**TEXT BOOKS**

1. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.

**REFERENCES**

1. William K Pratt, Digital Image Processing John Willey (2001)
2. Image Processing Analysis and Machine Vision – Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Learniy (1999).
3. A.K. Jain, PHI, New Delhi (1995)-Fundamentals of Digital Image Processing.
4. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India, 2000

**IT1003 FINANCIAL ACCOUNTING & MANAGEMENT 3 0 0 100**

**UNIT I FINANCIAL ACCOUNTING: 9**

Balance Sheet – Profit and loss statement – Financial ratios analysis – Cash flow and fund flow statements.

**UNIT II WORKING CAPITAL AND INVENTORY: 9**

Management of working capital – Factors influencing working capital decisions – Valuation of materials issue – Inventory management – Application of computers in inventory management.

**UNIT III COST ACCOUNTING: 9**

Cost accounting system – Preparation of cost sheets – Overhead allocation – Variance analysis.

**UNIT IV BUDGETING: 9**

Classification of budgets – Fixed and flexible budgets – Zero based budgeting.

**UNIT V CAPITAL MARKETS: 9**

Capital budgeting – Techniques of investment analysis – Cost of capital – Capital structure decisions.

**REFERNECES:**

1. Warren, 'Financial Accounting', Thomson Learning, 2002.
2. Subbash Sarma and M. Panduranga Vithal 'Financial Accounting for Management, MacMillan India Ltd, 2004.
3. Vanderbeck, 'Principles of Cost Accounting, 'Thomson Learning 2002.
4. Ashok Banerjee, 'Financial Accounting – a managerial emphasis', Excel Books 2001.

**EC1015                      SATELLITE COMMUNICATION                      3 0 0 100**

**AIM**

To enable the student to become familiar with satellites and satellite services.

**OBJECTIVES**

- Overview of satellite systems in relation to other terrestrial systems.
- Study of satellite orbits and launching.
- Study of earth segment and space segment components
- Study of satellite access by various users.
- Study of DTH and compression standards.

**UNIT I                      OVERVIEW OF SATELLITE SYSTEMS, ORBITS AND LAUNCHING METHODS                      9**

Introduction – Frequency Allocations for Satellite Services – Intelsat – U.S.Domsats – Polar Orbiting Satellites – Problems – Kepler's First Law – Kepler's Second Law – Kepler's Third Law – Definitions of Terms for Earth-orbiting Satellites – Orbital Elements – Apogee and Perigee Heights – Orbital Perturbations – Effects of a Nonspherical Earth – Atmospheric Drag – Inclined Orbits – Calendars – Universal Time – Julian Dates – Sidereal Time – The Orbital Plane – The Geocentric-Equatorial Coordinate System – Earth Station Referred to the IJK Frame – The Topcentric-Horizon Co-ordinate System – The Sub-satellite Point – Predicting Satellite Position.

**UNIT II                      GEOSTATIONARY ORBIT & SPACE SEGMENT                      9**

Introduction – Antenna Look Angels – The Polar Mount Antenna – Limits of Visibility – Near Geostationary Orbits – Earth Eclipse of Satellite – Sun Transit Outage – Launching Orbits – Problems – Power Supply – Attitude Control – Spinning Satellite Stabilization – Momentum Wheel Stabilization – Station Keeping – Thermal Control – TT&C Subsystem – Transponders – Wideband Receiver – Input Demultiplexer – Power Amplifier – Antenna Subsystem – Morelos – Anik-E – Advanced Tiro-N Spacecraft

**UNIT III                      EARTH SEGMENT & SPACE LINK                      9**

Introduction – Receive-Only Home TV Systems – Outdoor Unit – Indoor Unit for Analog (FM) TV – Master Antenna TV System – Community Antenna TV System – Transmit-Receive Earth Stations – Problems – Equivalent Isotropic Radiated Power – Transmission Losses – Free-Space Transmission – Feeder Losses – Antenna Misalignment Losses – Fixed Atmospheric and Ionospheric Losses – Link Power Budget Equation – System Noise – Antenna Noise – Amplifier Noise Temperature – Amplifiers in Cascade – Noise Factor – Noise Temperature of Absorptive Networks – Overall System Noise Temperature – Carrier-to-Noise Ratio – Uplink – Saturation Flux Density – Input Back Off – The Earth Station HPA – Downlink – Output Back off – Satellite TWTA Output – Effects of Rain – Uplink rain-fade margin – Downlink rain-fade margin – Combined Uplink and Downlink C/N Ratio – Intermodulation Noise.

**UNIT IV SATELLITE ACCESS****9**

Single Access – Preassigned FDMA, Demand-Assigned FDMA, SPADE System. Bandwidth-limited a Power-limited TWT amplifier operation, FDMA downlink analysis.

TDMA : Reference Burst; Preamble and Postamble, Carrier recovery, Network synchronization, unique word detection, Traffic Date, Frame Efficiency and Channel capacity, preassigned TDMA, Demand assigned TDMA, Speech Interpolation and Prediction, Downlink analysis for Digital transmission.

Companion of uplink Power requirements for FDMA & TDMA. On-board signal Processing for TDMA / FDMA operation, Satellite switched TDMA.

Code-Division Multiple Access – Direct-Sequence spread spectrum – code signal  $c(t)$  – autocorrelation function for  $c(t)$  – Acquisition and tracking – Spectrum spreading and despreading – CDMA throughput – Problems – Network Layers – TCP Link – Satellite Links and TCP – Enhancing TCP Over Satellite Channels Using Standard Mechanisms (RFC-2488) – Requests for comments – Split TCP connections – Asymmetric Channels – Proposed Systems.

**UNIT V DIRECT BROADCAST SATELLITE SERVICES****9**

Introduction – Orbital Spacings – Power Rating and Number of Transponders – Frequencies and Polarization – Transponder Capacity – Bit Rates for Digital Television – MPEG Compression Standards – Forward Error Correction – Home Receiver Outdoor Unit (ODU) – Home Receiver Indoor Unit (IDU) – Downlink Analysis – Uplink -Problems - Satellite Mobile Services – VSATs – Radarsat – Global Positioning Satellite System – Orbcomm.

**TOTAL : 45****TEXT BOOK**

1. Dennis Roddy, Satellite Communications, McGraw-Hill Publication Third edition 2001

**REFERENCES**

1. Timothy Pratt – Charles Bostian & Jeremy Allmuti, Satellite Communications, John Willy & Sons (Asia) Pvt. Ltd. 2004
2. Wilbur L. Pritchards Henri G.Suyder Hond Robert A.Nelson, Satellite Communication Systems Engineering, Pearson Education Ltd., Second edition 2003.
3. M.Richharia : Satellite Communication Systems (Design Principles Macmillan Press Ltd. Second Edition 2003.

**CS1005 ADVANCED JAVA PROGRAMMING****3 0 0 100****AIM**

To enable the students to design and develop enterprise strength distributed and multi-tier applications – Using Java Technology.

**OBJECTIVES**

- To learn advanced Java programming concepts like reflection, native code interface, threads, etc.
- To develop network programs in Java
- To understand Concepts needed for distributed and multi-tier applications
- To understand issues in enterprise applications development.

**UNIT I JAVA FUNDAMENTALS****9**

Java I/O streaming – filter and pipe streams – Byte Code interpretation - reflection – Dynamic Reflexive Classes – Threading – Java Native Interfaces- Swing.

**UNIT II NETWORK PROGRAMMING IN JAVA 9**

Sockets – secure sockets – custom sockets – UDP datagrams – multicast sockets – URL classes – Reading Data from the server – writing data – configuring the connection – Reading the header – telnet application – Java Messaging services

**UNIT III APPLICATIONS IN DISTRIBUTED ENVIRONMENT 9**

Remote method Invocation – activation models – RMI custom sockets – Object Serialization – RMI – IIOP implementation – CORBA – IDL technology – Naming Services – CORBA programming Models - JAR file creation

**UNIT IV MULTI-TIER APPLICATION DEVELOPMENT 9**

Server side programming – servlets – Java Server Pages - Applet to Applet communication – applet to Servlet communication - JDBC – Using BLOB and CLOB objects – storing Multimedia data into databases – Multimedia streaming applications – Java Media Framework.

**UNIT V ENTERPRISE APPLICATIONS 9**

Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans – Transactions.

**TOTAL : 45**

**TEXT BOOKS**

1. Elliotte Rusty Harold, “Java Network Programming”, O’Reilly publishers, 2000 (UNIT II)
2. Ed Roman, “Mastering Enterprise Java Beans”, John Wiley & Sons Inc., 1999. (UNIT III and UNIT V)
3. Hortsman & Cornell, “CORE JAVA 2 ADVANCED FEATURES, VOL II”, Pearson Education, 2002. (UNIT I and UNIT IV)

**REFERENCES**

1. **Web reference:** <http://java.sun.com>.
2. Patrick Naughton, “COMPLETE REFERENCE: JAVA2”, Tata McGraw-Hill, 2003.

**CS1012 NATURAL LANGUAGE PROCESSING 3 0 0 100**

**AIM**

The aim is to expose the students to the basic principles of language processing and typical applications of natural language processing systems

**OBJECTIVE**

- To provide a general introduction including the use of state automata for language processing
- To provide the fundamentals of syntax including a basic parse
- To explain advanced feature like feature structures and realistic parsing methodologies
- To explain basic concepts of remotes processing
- To give details about a typical natural language processing applications

**UNIT I INTRODUCTION 6**



**IT1004 BUSINESS PROCESS MODELS 3 0 0 100**

**AIM**

To understand the importance of business processes and their modeling for competitive advantage

**OBJECTIVES**

- To know the basics of business process
- To understand the various aspects of customer and materials processing
- To know the basic concepts of business process modeling
- To understand the specific issues related to large processes
- To understand the methodology of managing the modeling

**UNIT I UNDERSTANDING BUSINESS PROCESS 9**

Organizations as Systems, Effective Operations Management, Adding Value, Competing on Capabilities, Value Chain and Competitive Advantage

**UNIT II CUSTOMER AND MATERIALS PROCESSING 9**

Marketing in a Changing World, Relationship Marketing, Purchasing, Concept of a Manufacturing System, Logistics and Competitive Strategy, Reverse Logistics, The triumph of Process

**UNIT III PROCESS MODELING 9**

Process Modeller's Needs, Basic Concepts in Process Modeling, Modeling with RADS, Animating a Process

**UNIT IV LARGE PROCESSES 9**

Micro-Modeling of Processes, Modeling Large Processes, Process Patterns

**UNIT V MANAGING THE MODELING 9**

Modeling the Materials in the Process, Analyzing a Process Model, Managing the Modeling

**TOTAL : 45**

**TEXT BOOKS**

1. Davis Barnes (Editor), "Understanding Business : Process", Routledge, USA, 2000 [UNITS 1,2]
2. Martyn A Ould, "Business Processes : Modelling and Analysis for Re-Engineering and Improvement", John Wiley & Sons, USA, 1995 [UNITS 3,4,5]

**REFERENCES**

1. Howard Smith and Peter Fingar, "Business Process Management (BPM): The Third Wave", Meghan-Kiffer Press, USA, 2003
2. Roger Burlton, "Business Process Management : Profiting from Process", SAMS, USA, 2001
3. Mike Jacka J, Paulette J Keller, "Business Process Mapping : Improving Customer Satisfaction", John Wiley & Sons, USA, 2001
4. Faisal Haque, "e-Enterprise : Business Models, Architecture and Components", Cambridge University Press, UK, 2000.
5. Ulric J Gelinias, Steve G Sutton and Jane Fedorowicz, "Business Processes and Information Technology", Thompson Learning, India, 2004



**AIM**

At the end of the course the student will be able to design and implement a simple compiler.

**OBJECTIVES**

- To understand, design and implement a lexical analyzer.
- To understand, design and implement a parser.
- To understand, design code generation schemes.
- To understand optimization of codes and runtime environment.

**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****TEXT BOOK**

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.

**REFERENCES**

1. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.

2. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
3. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.
4. Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", PHI, 2001.
5. Kenneth C. Loudon, "Compiler Construction: Principles and Practice", Thompson Learning, 2003

**BM1007 MEDICAL INFORMATICS**

**3 0 0 100**

**AIM**

- To give comprehensive idea about multimedia applications in medical field to develop educational / training packages.
- To understand the component of virtual reality and virtual reality applications in medicine

**OBJECTIVES**

- To study the methods utilized for data storage, data retrieval and analysis
- To study the concept of visual programming and to develop VB based medical information systems.
- To expose to various applications of computer in medical field like neural network, fuzzy system and virtual reality.
- Based on the above knowledge to develop packages for transmission of medical information and for training.

**1. MEDICAL DATABASE IMPLEMENTATION 9**

Medical data acquisition and database systems: PC based multichannel data acquisition system; storage, analysis and retrieval techniques.

**2. VISUAL BASIC 9**

Visual programming concepts; visual Basic environment, tools and controls; Dynamic data exchange; VB based Medical information System.

**3. COMPUTERS IN SYSTEM DESIGN 9**

Hospital Information System its design and functional characteristics; Principles and application of Artificial Intelligence, Pattern Recognition, Neural Network and Fuzzy Logic in Medicine.

**4. MULTIMEDIA AND VIRTUAL REALITY APPLIED TO MEDICINE 9**

Basic concepts of Multimedia; Design of Multimedia information systems; Components of virtual reality; Virtual reality applications in medicine.

**5. COMPUTERS IN MEDICAL RESEARCH 9**

Medical Informatics and its levels; Design and development of educational packages on medical sciences; Integrated design concepts; Interactive multimedia, Virtual and digital libraries, Internet and its applications.

**TOTAL : 45**

**TEXT BOOK**

1. R.D.Lele, "Computer in Medicine", Tata McGraw-Hill, New Delhi, 1997.

**REFERENCES**

1. Tay Vaughan, "Multimedia making it work", Tata McGraw-Hill, New Delhi, 1997.



## REFERENCE

1. Attwood T K and Parry-Smith D J, "Introduction to Bioinformatics", Pearson Education Asia, New Delhi, 2001

**IT1006                      ENTERPRISE RESOURCE PLANNING                      3 0 0 100**

### AIM

**To know the strategic importance of Enterprise Resource Planning.**

### OBJECTIVES

- To know the basics of ERP
- To understand the key implementation issues of ERP
- To know the business modules of ERP
- To be aware of some popular products in the area of ERP
- To appreciate the current and future trends in ERP

**UNIT 1                      INTRODUCTION                      9**

ERP: An Overview, Enterprise – An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, SCM

**UNIT II                      ERP IMPLEMENTATION                      9**

ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring

**UNIT III                      THE BUSINESS MODULES                      9**

Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution

**UNIT IV                      THE ERP MARKET                      9**

ERP Market Place, SAP AG, Peoplesoft, Baan, JD Edwards, Oracle, QAD, SSA

**UNIT V                      ERP – PRESENT AND FUTURE                      9**

Turbo Charge the ERP System, EIA, ERP and e-Commerce, ERP and Internet, Future Directions

**TOTAL : 45**

### TEXT BOOK

1. Alexis Leon, "ERP Demystified", Tata McGraw Hill, New Delhi, 2000

### REFERENCES

1. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology, USA, 2001.
2. Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning – Concepts and Practice", PHI, New Delhi, 2003

**CS1022                      KNOWLEDGE BASED DECISION SUPPORT SYSTEM                      3 0 0 100**

### AIM

There has been a radical shift in the management parlance. Organizations can use Intranets and Internets to analyze various aspects about the performance and predict the future. This course aims at exposing the student to one of the important applications of the computer.

## **OBJECTIVE**

The course has been so designed as to include.

- Development of support system
- Methods of managing knowledge
- Intelligent decision system development

## **UNIT I INTRODUCTION 9**

Decision making, Systems, Modeling, and support – Introduction and Definition – Systems – Models – Modeling process – Decision making: The intelligence phase – The design phase - The choice phase – Evaluation: The implementation phase –Alternative Decision – Making models – Decision support systems – Decision makers - Case applications.

## **UNIT II DECISION SUPPORT SYSTEM DEVELOPMENT 9**

Decision Support System Development: Introduction - Life cycle – Methodologies – prototype – Technology Levels and Tools – Development platforms – Tool selection – Developing DSS  
Enterprise systems: Concepts and Definition – Evolution of information systems – Information needs – Characteristics and capabilities – Comparing and Integrating EIS and DSS – EIS data access, Data Warehouse, OLAP, Multidimensional analysis, Presentation and the web – Including soft information enterprise on systems - Organizational DSS – supply and value chains and decision support – supply chain problems and solutions – computerized systems MRP, ERP, SCM – frontline decision support systems.

## **UNIT III KNOWLEDGE MANAGEMENT 9**

Introduction – Organizational learning and memory – Knowledge management –Development –methods, Technologies, and Tools – success –Knowledge management and Artificial intelligence – Electronic document management.

Knowledge acquisition and validation: Knowledge engineering – Scope – Acquisition methods - Interviews – Tracking methods – Observation and other methods – Grid analysis – Machine Learning: Rule induction, case-based reasoning – Neural computing – Intelligent agents – Selection of an appropriate knowledge acquisition methods – Multiple experts – Validation and verification of the knowledge base – Analysis, coding, documenting, and diagramming – Numeric and documented knowledge acquisition – Knowledge acquisition and the Internet/Intranets.

Knowledge representation: Introduction – Representation in logic and other schemas – Semantic networks – Production rules – Frames – Multiple knowledge representation – Experimental knowledge representations - Representing uncertainty.

## **UNIT IV INTELLIGENT SYSTEM DEVELOPMENT 9**

Inference Techniques: Reasoning in artificial intelligence – Inference with rules: The Inference tree – Inference with frames – Model-based and case-based reasoning - Explanation and Meta knowledge – Inference with uncertainty – Representing uncertainty – Probabilities and related approaches – Theory of certainty – Approximate reasoning using fuzzy logic.

Intelligent Systems Development: Prototyping: Project Initialization – System analysis and design – Software classification: Building expert systems with tools – Shells and environments – Software selection – Hardware –Rapid prototyping and a demonstration prototype - System development –Implementation – Post implementation.

## **UNIT V MANAGEMENT SUPPORT SYSTEMS 9**

Implementing and integrating management support systems – Implementation: The major issues - Strategies – System integration – Generic models MSS, DSS, ES – Integrating EIS, DSS and ES, and



### **TEXT BOOK**

1. “Frontiers of Electronic Commerce”, Kalakota & Whinston, 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. “Electronic Commerce from Vision to Fulfillment”, PHI, Elias M. Awad, Feb-2003.
4. “Electronic Commerce – Framework, Technology and Application”, TMH, Bharat Bhaskar, 2003.
5. Effy Oz, “Foundations of E-Commerce”, PHI, 2001.
6. Jim A Carter, “Developing E-Commerce Systems”, PHI, 2001.

**EC1402**

**OPTICAL COMMUNICATION**

**3 0 0 100**

### **AIMS**

- To introduce the various optical fiber modes, configurations and various signal degradation factors associated with optical fiber.
- To study about various optical sources and optical detectors and their use in the optical communication system. Finally to discuss about digital transmission and its associated parameters on system performance.

### **OBJECTIVES**

- To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures.
- To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors. Design optimization of SM fibers, RI profile and cut-off wave length.
- To learn the various optical source materials, LED structures, quantum efficiency, Laser diodes and different fiber amplifiers.
- To learn the fiber optical receivers such as PIN APD diodes, noise performance in photo detector, receiver operation and configuration.
- To learn fiber slicing and connectors, noise effects on system performance, operational principles WDM and solutions.

### **UNIT I**

#### **INTRODUCTION TO OPTICAL FIBERS**

**9**

Evolution of fiber optic system- Element of an Optical Fiber Transmission link- Ray Optics-Optical Fiber Modes and Configurations –Mode theory of Circular Wave guides- Overview of Modes-Key Modal concepts- Linearly Polarized Modes –Single Mode Fibers-Graded Index fiber structure.

### **UNIT II**

#### **SIGNAL DEGRADATION OPTICAL FIBERS**

**9**

Attenuation – Absorption losses, Scattering losses, Bending Losses, Core and Cladding losses, Signal Distortion in Optical Wave guides-Information Capacity determination –Group Delay-Material Dispersion, Wave guide Dispersion, Signal distortion in SM fibers-Polarization Mode dispersion, Intermodal dispersion, Pulse Broadening in GI fibers-Mode Coupling –Design Optimization of SM fibers-RI profile and cut-off wavelength.

### **UNIT III**

#### **FIBER OPTICAL SOURCES AND COUPLING**

**9**

Direct and indirect Band gap materials-LED structures –Light source materials –Quantum efficiency and LED power, Modulation of a LED, lasers Diodes-Modes and Threshold condition –Rate equations – External Quantum efficiency –Resonant frequencies –Laser Diodes, Temperature effects, Introduction to Quantum laser, Fiber amplifiers- Power Launching and coupling, Lencing schemes, Fibre –to- Fibre joints, Fibre splicing.

**UNIT IV FIBER OPTICAL RECEIVERS 9**  
PIN and APD diodes –Photo detector noise, SNR, Detector Response time, Avalanche Multiplication Noise –Comparison of Photo detectors –Fundamental Receiver Operation – preamplifiers, Error Sources – Receiver Configuration –Probability of Error – Quantum Limit.

**UNIT V DIGITAL TRANSMISSION SYSTEM 9**  
Point-to-Point links System considerations –Link Power budget –Rise - time budget –Noise Effects on System Performance-Operational Principles of WDM, Solitons-Erbium-doped Amplifiers. Basic on concepts of SONET/SDH Network. .

**TOTAL : 45**

**TEXT BOOK**

1. Gerd Keiser, “Optical Fiber Communication” McGraw–Hill International, Singapore, 3<sup>rd</sup> ed., 2000

**REFERENCES**

1. J.Senior, “Optical Communication, Principles and Practice”, Prentice Hall of India, 1994.
2. J.Gower, “Optical Communication System”, Prentice Hall of India, 2001.

**CS1010 C # AND .NET FRAMEWORK 3 0 0 100**

**AIM**

To cover the fundamental concepts of the C# language and the .NET framework.

**OBJECTIVE**

The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.

The student will gain programming skills in C# both in basic and advanced levels. By building sample applications, the student will get experience and be ready for large–scale projects.

**UNIT I INTRODUCTION TO C# 8**  
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# 9**  
Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

**UNIT III APPLICATION DEVELOPMENT ON .NET 8**  
Building Windows Applications, Accessing Data with ADO.NET.

**UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET 8**  
Programming Web Applications with Web Forms, Programming Web Services.

**UNIT V THE CLR AND THE .NET FRAMEWORK 12**







## REFERENCES

1. Edward Kit, "Software Testing in the Real World – Improving the Process", Pearson Education, New Delhi, 1995
2. Elfriede Dustin, "Effective Software Testing", Pearson Education, New Delhi, 2003
3. Renu Rajani and Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw-Hill, New Delhi, 2003

**IT1009 WEB SERVICES**

**3 0 0 100**

## AIM

To understand the concept of XML and to implement Web services using XML based standards.

## OBJECTIVES

- To understand the advantages of using XML technology family
- To analyze the problems associated with tightly coupled distributed software architecture
- To learn the Web services building block
- To implement e-business solutions using XML based web services

**UNIT I XML TECHNOLOGY FAMILY 9**

XML – benefits – Advantages of XML over HTML, EDI, Databases – XML based standards – Structuring with schemas - DTD – XML Schemas – XML processing – DOM – SAX – presentation technologies – XSL – XFORMS – XHTML – Transformation – XSLT – XLINK – XPATH – XQuery

**UNIT II ARCHITECTING WEB SERVICES 9**

Business motivations for web services – B2B – B2C – Technical motivations – limitations of CORBA and DCOM – Service-oriented Architecture (SOA) – Architecting web services – Implementation view – web services technology stack – logical view – composition of web services – deployment view – from application server to peer to peer – process view – life in the runtime

**UNIT III WEB SERVICES BUILDING BLOCKS 9**

Transport protocols for web services – messaging with web services - protocols - SOAP - describing web services – WSDL – Anatomy of WSDL – manipulating WSDL – web service policy – Discovering web services – UDDI – Anatomy of UDDI – Web service inspection – Ad-Hoc Discovery - Securing web services

**UNIT IV IMPLEMENTING XML IN E-BUSINESS 9**

B2B – B2C Applications – Different types of B2B interaction – Components of e-business XML systems – ebXML – RosettaNet - Applied XML in vertical industry – web services for mobile devices.

**UNIT V XML CONTENT MANAGEMENT AND SECURITY 9**

Semantic Web – Role of Meta data in web content - Resource Description Framework – RDF schema – Architecture of semantic web – content management workflow – XLANG – WSFL – Securing web services

**TOTAL : 45**

## TEXT BOOK

1. Ron Schmelzer et al. "XML and Web Services", Pearson Education, 2002.

## REFERENCES

1. Keith Ballinger, “. NET Web Services Architecture and Implementation”, Pearson Education, 2003.
2. David Chappell, “Understanding .NET A Tutorial and Analysis”, Addison Wesley, 2002.
3. Kennard Scibner and Mark C.Stiver, “ Understanding SOAP”, SAMS publishing.
4. Alexander Nakhimovsky and Tom Myers, “XML Programming: Web Applications and Web Services with JSP and ASP”, Apress, 2002.

**IT1010 MOBILE NETWORKS**

**3 0 0 100**

## AIM

**To provide basic for various techniques in mobile Networks/Adhoc Networks and New technology of Wireless Broadband Networks**

## OBJECTIVES

- To learn the basics of Routing and protocols in Adhoc and Sensor Networks,
- To learn Wireless Broadband Networks Technology Overview, Platforms and Standards.
- To learn management, testing and troubleshooting in Wireless Broadband Networks working principles of wireless LAN, its standards.
- To learn latest wireless networks

## UNIT I AD HOC NETWORKS

**9**

Characteristics and Applications of Ad hoc Networks, Routing – Need for routing and routing classifications, Table Driven Routing Protocols, Source Initiated On-Demand Routing Protocols,, Hybrid Protocols – Zone Routing, Fisheye Routing, LANMAR for MANET with group mobility, Location Added Routing, Distance Routing Effects, Microdiscovery and Power Aware Routing

## UNIT II SENSOR NETWORKS

**9**

Wireless Sensor Networks, DARPA Efforts, Classification, Fundamentals of MAC, Flat routing – Directed Diffusion, SPIN, COGUR, Hierarchical Routing, Cluster base routing, Scalable Coordination, LEACH, TEEN, APTEEN and Adapting to the dynamic nature of Wireless Sensor Networks.

## UNIT III WIRELESS BROADBAND NETWORKS TECHNOLOGY OVERVIEW, PLATFORMS AND STANDARDS

**9**

Wireless broadband fundamentals and Fixed Wireless Broadband Systems, Platforms- Enhanced Copper, Fibre Optic and HFC, 3G Cellular, Satellites, ATM and Relay Technologies, HiperLAN2 Standard, Global 3G CDMA Standard, CDMA Harmonization G3G Proposal for Protocol Layers

## UNIT IV MANAGING WIRELESS NETWORKS AND TESTING

**9**

Managing Wireless Broadband Operations Management of LMDS Systems and their Application, Principles of operations Management, LMDS Versus Other Access technologies, Applications, Testing Wireless Satellite Networks and Fixed Wireless Broadband Networks

## UNIT V ADVANCED WIRELESS NETWORKS

**9**

Wireless. Broadband Network Applications: Teleservices Model and Adaptive QoS Parameters, Modeling of Wireless. Broadband Applications, Multicomponent Model, Residential High speed Internet Wireless Broadband Satellite Systems, Next Generation Wireless Broadband Networks – 3G, Harmonized 3G, 3G CDMA, Smart Phones and 3G Evolution

**TOTAL : 45**

## TEXT BOOKS

1. Joh R. Vacca, "Wireless Broadband Networks Handbook 3G, LMDS and Wireless Internet" Tata McGraw-Hill, 2001 (Unit III Chapter – 1, 2, 5; Unit IV Chapter 22, 23, 24, Unit V Chapter 25, 26 and 28)
2. D.P. Agrawal and Qing-An zeng, "Introduction to Wireless and Mobile Systems" Thomson Learning, 2003. [Unit I, Chapter 13.1 to 13.7.7, Unit 2 13.7.8 to 13.9]

## REFERENCES

1. Martyn Mallick, Mobile and Wireless Design Essentials, Wiley, 2003
2. Kavesh Pahlavan and Prashant Krishnamurty - "Principles of Wireless Networks – A unified Approach, Pearson Education, 2002

## IT1011 DIGITAL ASSET MANAGEMENT

3 0 0 100

### AIM

To understand the key issues in the emerging discipline of Digital Asset Management

### OBJECTIVES

- To understand the ways and means of creating digital content
- To understand the methods of storing large digital content
- To know the basics of Content Management
- To know the key design issues of Content Management Systems
- To know the key technologies to build Content Management Systems.

### UNIT I CREATING DIGITAL CONTENT

8

Digital Primer, Any Content – Anywhere, Anytime, Digital Content Consumer, Tools and the Trade, Digital Recording, CGI and Digital Content Creation, Digital Audio, Rich Media, Streaming Media, Digital Interactive Television, Digital Cinema.

### UNIT II COMPRESSING AND INDEXING

9

Document Databases, Compression, Indexes, Text Compression, Indexing Techniques, Image Compression, Mixed Text and Images

### UNIT III CONTENT MANAGEMENT

10

Systems for Managing Content, The Enterprise Content Management System (CMS), Major parts of a CMS, Need for a CMS, Roots of Content Management, Branches of Content Management

### UNIT IV DESIGN OF CMS

10

The Wheel of CMS, Working with Metadata, Cataloging Audiences, Designing Publications, Designing content Components, Accounting for Authors, Accounting for Acquisition sources,

### UNIT V BUILDING CMS

8

Content Markup Languages, XML and Content Management, Processing Content

**TOTAL : 45**

### TEXTBOOKS



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).

**5**

## **UNIT II**

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.

**10**

## **UNIT III**

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

**10**

## **UNIT IV**

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.

**10**

## **UNIT V**

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.

**10**

## **TEXT BOOK**

1. Subbaram N.R. “ Handbook of Indian Patent Law and Practice “, S. Viswanathan (Printers and Publishers) Pvt. Ltd., 1998.

## **REFERENCES**

1. Eli Whitney, United States Patent Number : 72X, Cotton Gin, March 14, 1794.
2. Intellectual Property Today : Volume 8, No. 5, May 2001, [www.iptoday.com].
3. Using the Internet for non-patent prior art searches, Derwent IP Matters, July 2000. [www.ipmatters.net/features/000707\_gibbs.html.

**GE 1002**

**INDIAN CONSTITUTION AND SOCIETY**

**3 0 0 100**

## **UNIT I**

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.

**9**

## **UNIT II**

Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review. **9**

## **UNIT III**

State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts. **9**

## **UNIT IV**

Indian Federal System – Center – State Relations – President’s Rule – Constitutional Amendments – Constitutional Functionaries - Assessment of working of the Parliamentary System in India. **9**

## **UNIT V**

Society : Nature, Meaning and definition; Indian Social Structure; Caste, 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. **9**

## **TEXT 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.

## **REFERENCES**

1. Sharma, Brij Kishore, “ Introduction to the Constitution of India., Prentice Hall of India, New Delhi.
2. U.R.Gahai, “ (1998) Indian Political System “, New Academic Publishing House, Jalaendhar.
3. R.N. Sharma, “ Indian Social Problems “, Media Promoters and Publishers Pvt. Ltd.
4. Yogendra Singh, “ (1997) Social Stratification and Change in India “, Manohar, New Delhi.

**CS1151**

**DATA STRUCTURES**

**3 1 0 100**

### **AIM**

To provide an in-depth knowledge in problem solving techniques and data structures.

### **OBJECTIVES**

- To learn the systematic way of solving problems
- To understand the different methods of organizing large amounts of data
- To learn to program in C
- To efficiently implement the different data structures
- To efficiently implement solutions for specific problems

### **UNIT I PROBLEM SOLVING**

**9**

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

### **UNIT II**

**LISTS, STACKS AND QUEUES**

**8**



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

**UNIT III TREES 10**

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 9**

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

**UNIT V GRAPHS 9**

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

**TUTORIAL 15**  
**TOTAL : 60**

**TEXT BOOKS**

1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2<sup>nd</sup> ed, Pearson Education Asia, 2002. (chaps 3, 4.1-4.4 (except 4.3.6), 4.6, 5.1-5.4.1, 6.1-6.3.3, 7.1-7.7 (except 7.2.2, 7.4.1, 7.5.1, 7.6.1, 7.7.5, 7.7.6), 7.11, 9.1-9.3.2, 9.5-9.5.1, 9.6-9.6.2, 9.7)

**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.

**CS1152 DATA STRUCTURES LAB 0 0 3 100**

**AIM**

To teach the principles of good programming practice and to give a practical training in writing efficient programs in C

**OBJECTIVES**

- To teach the students to write programs in C
- To implement the various data structures as Abstract Data Types
- To write programs to solve problems using the ADTs

**Implement the following exercises using C:**

1. Array implementation of List Abstract Data Type (ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array implementations of Stack ADT
5. Linked list implementations of Stack ADT

The following three exercises are to be done by implementing the following source files

- (a) Program for 'Balanced Paranthesis'
- (b) Array implementation of Stack ADT

(c) Linked list implementation of Stack ADT

(d) Program for 'Evaluating Postfix Expressions'

An appropriate header file for the Stack ADT should be #included in (a) and (d)

6. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
7. Implement the application for checking 'Balanced Paranthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
8. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
9. Queue ADT
10. Search Tree ADT - Binary Search Tree
11. Heap Sort
12. Quick Sort