

**ANNA UNIVERSITY, CHENNAI**  
**AFFILIATED INSTITUTIONS**  
**R-2008**  
**B.TECH. INFORMATION TECHNOLOGY**  
**II - VIII SEMESTERS CURRICULA AND SYLLABI**  
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## SEMESTER VI

(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
<b>THEORY</b>					
IT2351	<u>Network Programming and Management</u>	3	0	0	3
CS2353	<u>Object Oriented Analysis and Design</u>	3	0	0	3
IT2352	<u>Cryptography and Network Security</u>	3	0	0	3
IT2353	<u>Web Technology</u>	3	0	0	3
IT2354	<u>Embedded Systems</u>	3	0	0	3
	Elective I	3	0	0	3
<b>PRACTICAL</b>					
IT2357	<u>Web Technology Lab</u>	0	0	3	2
CS2357	<u>Object Oriented Analysis and Design Lab</u>	0	0	3	2
CS2307	<u>Network Lab</u>	0	0	3	2
<b>TOTAL</b>		<b>18</b>	<b>0</b>	<b>9</b>	<b>24</b>

### LIST OF ELECTIVES

#### SEMESTER VI – Elective I

Code No.	Course Title	L	T	P	C
MA2264	<u>Numerical Methods</u>	3	1	0	4
MA2265	<u>Discrete Mathematics</u>	3	1	0	4
IT2021	<u>Business Process Model</u>	3	0	0	3
IT2022	<u>Software Requirement Engineering</u>	3	0	0	3
IT2023	<u>Digital Image Processing</u>	3	0	0	3

IT2024	<u>User Interface Design</u>	3	0	0	3
CS2022	<u>Visual Programming</u>	3	0	0	3
CS2032	<u>Data Warehousing and Data Mining</u>	3	0	0	3

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**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, ELEMENTARY 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 PERIODS****TEXT BOOKS:**

1. W. Richard Stevens, "Unix Network Programming Vol-I", Second Edition, Pearson Education, 1998.
2. Mani Subramaniam, "Network Management: Principles and Practice", Addison Wesley, First Edition, 2001.

**REFERENCES:**

1. D.E. Comer, "Internetworking with TCP/IP Vol- III", (BSD Sockets Version), Second Edition, Pearson Education, 2000
2. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", Third Edition, Addison Wesley, 1999.

**OBJECTIVES**

- To learn basic OO analysis and design skills through an elaborate case study.
- To use the UML design diagrams
- To apply the appropriate design patterns

<b>UNIT I</b>	<b>9</b>
Introduction to OOAD – What is OOAD? – What is UML? What are the United process(UP) phases - Case study – the NextGen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization.	
<b>UNIT II</b>	<b>9</b>
Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class hierarchies- Aggregation and Composition- UML activity diagrams and modeling	
<b>UNIT III</b>	<b>9</b>
System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams	
<b>UNIT IV</b>	<b>9</b>
GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling –Controller – High Cohesion – Designing for visibility - Applying GoF design patterns – adapter, singleton, factory and observer patterns.	
<b>UNIT V</b>	<b>9</b>
UML state diagrams and modeling - Operation contracts- Mapping design to code -UML deployment and component diagrams	

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

1. Craig Larman,"Applying UML and Patterns: An Introduction to object-oriented Analysis and Design and iterative development", Third Edition, Pearson Education, 2005

**REFERENCES:**

1. Mike O'Docherty, "Object-Oriented Analysis & Design: Understanding System Development with UML 2.0", John Wiley & Sons, 2005.
2. James W- Cooper, Addison-Wesley, "Java Design Patterns – A Tutorial", 2000.
3. Micheal Blaha, James Rambaugh, "Object-Oriented Modeling and Design with UML", Second Edition, Prentice Hall of India Private Limited, 2007
4. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides,"Design patterns: Elements of Reusable object-oriented software", Addison-Wesley, 1995.

**UNIT I****9**

Security trends – Attacks and services – Classical crypto systems – Different types of ciphers – LFSR sequences – Basic Number theory – Congruences – Chinese Remainder theorem – Modular exponentiation – Fermat and Euler's theorem – Legendre and Jacobi symbols – Finite fields – continued fractions.

**UNIT II****9**

Simple DES – Differential cryptoanalysis – DES – Modes of operation – Triple DES – AES – RC4 – RSA – Attacks – Primality test – factoring.

**UNIT III****9**

Discrete Logarithms – Computing discrete logs – Diffie-Hellman key exchange – ElGamal Public key cryptosystems – Hash functions – Secure Hash – Birthday attacks – MD5 – Digital signatures – RSA – ElGamal – DSA.

**UNIT IV****9**

Authentication applications – Kerberos, X.509, PKI – Electronic Mail security – PGP, S/MIME – IP security – Web Security – SSL, TLS, SET.

**UNIT V****9**

System security – Intruders – Malicious software – viruses – Firewalls – Security Standards.

**TOTAL:45 PERIODS****TEXT BOOKS:**

1. Wade Trappe, Lawrence C Washington, " Introduction to Cryptography with coding theory", 2<sup>nd</sup> ed, Pearson, 2007.
2. William Stallings, "Cryptography and Network security Principles and Practices", Pearson/PHI, 4<sup>th</sup> ed, 2006.

**REFERENCES:**

1. W. Mao, "Modern Cryptography – Theory and Practice", Pearson Education, Second Edition, 2007.
2. Charles P. Pfleeger, Shari Lawrence Pfleeger – Security in computing Third Edition – Prentice Hall of India, 2006

**UNIT I** **9**

Web Essentials: Clients, Servers, and Communication. The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers-Case Study. Markup Languages: XHTML. An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents Case Study.

**UNIT II** **9**

Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rle Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-Other Properties-Case Study. Client-Side Programming: The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

**UNIT III** **9**

Host Objects : Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window-Case Study. Server-Side Programming: Java Servlets- Architecture -Overview-A Servelet-Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servelets and Concurrency-Case Study-Related Technologies.

**UNIT IV** **9**

Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration - Namespaces JavaScript and XML: Ajax-DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data:XPath-Template-based Transformations: XSLT-Displaying XML Documments in Browsers-Case Study-Related Technologies. Separating Programming and Presentation: JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm-Case Study-Related Technologies.

**UNIT V** **9**

Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files-Databases and Java Servlets.

**TEXT BOOK**

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.

## REFERENCES

1. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.
2. Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006.
3. Marty Hall and Larry Brown, "Core Web Programming" Second Edition, Volume I and II, Pearson Education, 2001.
4. Bates, "Developing Web Applications", Wiley, 2006.

**IT2354**

**EMBEDDED SYSTEMS**

**L T P C**  
**3 0 0 3**

<b>UNIT I</b>	<b>EMBEDDED COMPUTING</b>	<b>9</b>
Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.		
<b>UNIT II</b>	<b>MEMORY AND INPUT / OUTPUT MANAGEMENT</b>	<b>9</b>
Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.		
<b>UNIT III</b>	<b>PROCESSES AND OPERATING SYSTEMS</b>	<b>9</b>
Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Performance issues.		
<b>UNIT IV</b>	<b>EMBEDDED SOFTWARE</b>	<b>9</b>
Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers.		
<b>UNIT V</b>	<b>EMBEDDED SYSTEM DEVELOPMENT</b>	<b>9</b>
Design issues and techniques – Case studies – Complete design of example embedded systems.		

**TOTAL : 45PERIODS**

## TEXT BOOKS

1. Wayne Wolf, "Computers as Components: Principles of Embedded Computer System Design", Elsevier, 2006.
2. Michael J. Pont, "Embedded C", Pearson Education , 2007.

## REFERENCES:

1. Steve Heath, "Embedded System Design", Elsevier, 2005.
2. Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay, "The 8051 Microcontroller and Embedded Systems", Pearson Education, Second edition, 2007.

**LIST OF EXPERIMENTS**

1. Create a web page with the following using HTML
  - i) To embed an image map in a web page
  - ii) To fix the hot spots
  - iii) Show all the related information when the hot spots are clicked.
2. Create a web page with all types of Cascading style sheets.
3. Client Side Scripts for Validating Web Form Controls using DHTML
4. Write programs in Java to create applets incorporating the following features:
  - Create a color palette with matrix of buttons
  - Set background and foreground of the control text area by selecting a color from color palette.
  - In order to select Foreground or background use check box control as radio buttons
  - To set background images
5. Write programs in Java using Servlets:
  - To invoke servlets from HTML forms
  - To invoke servlets from Applets
6. Write programs in Java to create three-tier applications using JSP and Databases
  - for conducting on-line examination.
  - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
7. Programs using XML – Schema – XSLT/XSL
8. Programs using AJAX
9. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.

**OBJECTIVE:**

**To develop a mini-project following the 12 exercises listed below.**

1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).



3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identify the conceptual classes and develop a domain model with UML Class diagram.
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.

### **Suggested domains for Mini-project.**

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

### **Suggested Software Tools**

ArgoUML, Eclipse IDE, Visual Paradigm, Visual case, and Rational Suite

**CS2307**

**NETWORKS LAB**

**L T P C**  
**0 0 3 2**

1. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
2. Programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols
6. Experiments using simulators (like OPNET)
7. Performance comparison of MAC protocols
8. Performance comparison of Routing protocols
9. Study of TCP/UDP performance

**TOTAL: 60 PERIODS**

**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:

- i. The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigen value problem of a matrix can be obtained numerically where analytical methods fail to give solution.
- ii. 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.
- iii. 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.
- iv. 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**

Solution of equation –Fixed point iteration:  $x=g(x)$  method - Newton's method – Solution of linear system by Gaussian elimination and Gauss-Jordon method– Iterative method - Gauss-Seidel method - Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix by power method and by Jacobi method for symmetric matrix.

**UNIT II INTERPOLATION AND APPROXIMATION 9**

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

**UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 9**

Differentiation using interpolation formulae –Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules – Romberg's method – Two and Three point Gaussian quadrature formulae – Double integrals using trapezoidal and Simpsons's rules.

**UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 9**

Single step methods: Taylor series method – Euler method for first order equation – 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**

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.

**L = 45 TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Veerarjan, T and Ramachandran, T. 'Numerical methods with programming in 'C' Second Edition, Tata McGraw-Hill Publishing.Co.Ltd. (2007).
2. Sankara Rao K, 'Numerical Methods for Scientists and Engineers' – 3<sup>rd</sup> edition Printice Hall of India Private Ltd, New Delhi, (2007).

**REFERENCES:**

1. Chapra, S. C and Canale, R. P. "Numerical Methods for Engineers", 5<sup>th</sup> Edition, Tata McGraw-Hill, New Delhi, 2007.
2. Gerald, C. F. and Wheatley, P.O., "Applied Numerical Analysis", 6<sup>th</sup> Edition, Pearson Education Asia, New Delhi, 2006.
3. Grewal, B.S. and Grewal,J.S., " Numerical methods in Engineering and Science", 6<sup>th</sup> Edition, Khanna Publishers, New Delhi, 2004

**AIM**

To extend student's Logical and 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 an understanding in identifying structures 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 aware of the counting principles
- Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.

**UNIT I LOGIC AND PROOFS 9 + 3**  
Propositional Logic – Propositional equivalences-Predicates and quantifiers-Nested Quantifiers-Rules of inference-introduction to Proofs-Proof Methods and strategy

**UNIT II COMBINATORICS 9 + 3**  
Mathematical inductions-Strong induction and well ordering-.The basics of counting-The pigeonhole principle –Permutations and combinations-Recurrence relations-Solving Linear recurrence relations-generating functions-inclusion and exclusion and applications.

**UNIT III GRAPHS 9 + 3**  
Graphs and graph models-Graph terminology and special types of graphs-Representing graphs and graph isomorphism-connectivity-Euler and Hamilton paths

**UNIT IV ALGEBRAIC STRUCTURES 9 + 3**  
Algebraic systems-Semi groups and monoids-Groups-Subgroups and homomorphisms-Cosets and Lagrange's theorem- Ring & Fields (Definitions and examples)

**UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 3**  
Partial ordering-Posets-Lattices as Posets- Properties of lattices-Lattices as Algebraic systems –Sub lattices –direct product and Homomorphism-Some Special lattices-Boolean Algebra

**LECTURES :45 TUTORIAL :15 TOTAL: 60 PERIODS**

**TEXT BOOKS:**

1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", Special Indian edition, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, (2007). (For the units 1 to 3, Sections 1.1 to 1.7 , 4.1 & 4.2, 5.1 to 5.3, 6.1, 6.2, 6.4 to 6.6, 8.1 to 8.5)
2. Trembly J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 30<sup>th</sup> Re-print (2007).(For units 4 & 5, Sections 2-UNIT III8 & 2-UNIT III9,3-1,3-2 & 3-5, 4-1 & 4-2)

## REFERENCES:

1. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, (2002).
2. Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Publications, (2006).
3. Seymour Lipschutz and Mark Lipson, "Discrete Mathematics", Schaum's Outlines, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, Second edition, (2007).

**IT2021**

**BUSINESS PROCESS MODEL**

**L T P C**  
**3 0 0 3**

**UNIT I ORGANIZATIONAL STRUCTURE 9**  
Types of Business Organizations-Organizational Structures-Definition-Complexity-Formulization-Size-Technology-Culture-Forms and Outcomes-Explanations of Structures-IT Industry and Organizational Structures-Processes of organizations-Case Studies

**UNIT II PROCESS FLOW MEASUREMENT 9**  
Process flow measures - flow rate - flow time - inventory - flow-time analysis - process flow chart - flow-time measurement - CPM - managing flow-time - flow-rate and capacity analysis - resources and resource pools - flow-rate measurement - process capacity - inventory analysis

**UNIT III PROCESS FLOW VARIABILITY 9**  
Managing flow variability - safety inventory - demand forecasts and forecast errors - optimal services level - lead time demand variability - safety capacity - service processes and performance measures - queueing process - buffer capacity - synchronization and capacity and demand - process control and capability - performance variability - process capability measurement and improvement - product and process design - process synchronization and improvement

**UNIT IV BUSINESS PROCESS REENGINEERING 9**  
Introduction to Business Process Re-engineering (BPR)-Meaning-Types-Process-Impetative for Survival-Strategic Approach-Implementing Business Process Re-engineering-Methodology and Steps-Indian Scenario of Implementing BPR-Case Studies

**UNIT V BPR AND IT INDUSTRY 9**  
BPR and Information Technology Process-People View and Perspectives-Empowering People through IT-Managing Change in the Global Environment-BPR Rediscovering Indian Paradigm-Need of Reengineering-Case Studies

**TOTAL : 45 PERIODS**

## TEXTBOOKS:

1. Richard H.Hall, "Organizations - Structures, Processes and Outcomes", Pearson Education, 2004
2. Ravi Anupindi et. al., "Managing Business Process Flows", Pearson Education, 1999.
3. M.S.Jayaraman et. al, "Business Process Reengineering", Tata Mc Graw Hill Publications, 2001

## REFERENCES

1. Gareth Jones, "Organizational Theory, Design and Change", Pearson Education, 4<sup>th</sup> Edition, 2004
2. John Jeston and Johan Nelis, "Business Process Management", Elsevier, 2006.

IT2022

SOFTWARE REQUIREMENT ENGINEERING

L T P C  
3 0 0 3

### UNIT I INTRODUCTION 9

Introduction - Requirements Problem – Requirements management – Requirements and software life cycle-software team.

### UNIT II ANALYSING THE PROBLEM 9

The five steps in problem analysis– business modeling – Systems engineering of software intensive systems – Understanding user and stakeholders needs – Features of a product or system –Interviewing – Requirements workshops- Brain storming and Idea reduction- storyboarding

### UNIT III DEFINING THE SYSTEM 9

Use case primer-Organizing requirement Information-Vision Document-Product Management-Managing scope-Establishing Project scope-Managing customer

### UNIT IV REFINING THE SYSTEM DEFINITION 9

Software requirement-Refining the use cases-developing the supplementary specification- Ambiguity and specificity -Technical methods for specifying requirements

### UNIT V BUILDING THE RIGHT SYSTEM 9

From use cases to Implementation-From use Cases to Test cases-Tracing requirements-Managing Change-Assessing Requirements Quality in Iterative Development-Agile Requirement methods.

**TOTAL : 45 PERIODS**

### TEXT BOOK:

1. Leffingwell, D., Widrig, D., "Managing Software Requirements A Use case approach", Second Edition, Pearson Education, 2000UNIT III

### REFERENCES:

- 1.. Swapna Kishore, Rajesh Naik, "Software Requirements and Estimation", Tata McGraw Hill, 2001
2. K.Weigers, Software Requirements, Microsoft Press, 1999.
- 3 Ian Sommerville and P Sawyer, "Requirements engineering a good practice Guide", Wiley India, 1997

**AIM:**

The aim is to inculcate a basic training in the processing of images for practical applications in the domain of medical, remoting sessions and in general.

**OBJECTIVES:**

- To introduce basic concepts in acquiring, storage and Process of images
- To introduce for enhancing the quality of images.
- To introduce techniques for extraction and processing of region of interest
- To introduce case studies of Image Processing.

**UNIT I FUNDAMENTALS OF IMAGE PROCESSING 9**

Introduction – Steps in Image Processing Systems – Image Acquisition – Sampling and Quantization – Pixel Relationships – Colour Fundamentals and Models, File Formats, Image operations – Arithmetic, Geometric and Morphological.

**UNIT II IMAGE ENHANCEMENT 9**

Spatial Domain Gray level Transformations Histogram Processing Spatial Filtering – Smoothing and Sharpening. Frequency Domain : Filtering in Frequency Domain – DFT, FFT, DCT – Smoothing and Sharpening filters – Homomorphic Filtering.

**UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS 9**

Detection of Discontinuities – Edge Operators – Edge Linking and Boundary Detection – Thresholding – Region Based Segmentation – Morphological WaterSheds – Motion Segmentation, Feature Analysis and Extraction.

**UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS 9**

Multi Resolution Analysis : Image Pyramids – Multi resolution expansion – Wavelet Transforms.

Image Compression : Fundamentals – Models – Elements of Information Theory – Error Free Compression – Lossy Compression – Compression Standards.

**UNIT V APPLICATIONS OF IMAGE PROCESSING 9**

Image Classification – Image Recognition – Image Understanding – Video Motion Analysis – Image Fusion – Steganography – Digital Compositing – Mosaics – Colour Image Processing..

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

1. Rafael C.Gonzalez and Richard E.Woods, “Digital Image Processing” Second Edition, Pearson Education, 2000UNIT III

**REFERENCES:**

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, “Image Processing, Analysis and Machine Vision”, Second Edition, Thomson Learning, 2001
2. Anil K.Jain, “Fundamentals of Digital Image Processing”, PHI, 2006.
3. Sanjit K. Mitra, & Giovanni L. Sicuranza, “Non Linear Image Processing”, Elsevier, 2007.
4. Richard O. Duda, Peter E. HOF, David G. Stork, “Pattern Classification” Wiley Student Edition, 2006.

IT2024

**USER INTERFACE DESIGN**

**L T P C**  
**3 0 0 3**

**UNIT I INTRODUCTION 8**

Human-Computer Interface – Characteristics Of Graphics Interface –Direct Manipulation Graphical System – Web User Interface –Popularity –Characteristic & Principles.

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**UNIT II HUMAN COMPUTER INTERACTION 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 Menu – Functions Of Menu– Contents Of Menu– Formatting – Phrasing The Menu – Selecting Menu Choice– Navigating Menus– Graphical Menus.

**UNIT III WINDOWS 9**

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 MULTIMEDIA 9**

Text For Web Pages – Effective Feedback– Guidance & Assistance– Internationalization– Accesssibility– Icons– Image– Multimedia – Coloring.

**UNIT V WINDOWS LAYOUT– TEST 9**

Prototypes – Kinds Of Tests – Retest – Information Search – Visualization – Hypermedia – WWW– Software Tools.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Wilbent. O. Galitz ,“The Essential Guide To User Interface Design”, John Wiley& Sons, 2001.
2. Ben Sheiderman, “Design The User Interface”, Pearson Education, 1998.

**REFERENCE:**

1. Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd., 2002.

CS2022

**VISUAL PROGRAMMING**

**L T P C**  
**3 0 0 3**

**UNIT I 9**

Windows Programming Fundamentals – MFC – Windows – Graphics – Menus – Mouse and keyboard – Bitmaps – Palettes – Device-Independent Bitmaps

**UNIT II 9**

Controls – Modal and Modeless Dialog – Property – Data I/O – Sound – Timer 1



**UNIT III** **9**  
Memory management – SDI – MDI – MFC for Advanced windows user Interface – status bar and Toolbars – Tree view – List view – Threads

**UNIT IV** **9**  
ODBC – MFC Database classes – DAO - DLLs – Working with Images

**UNIT V** **9**  
COM Fundamentals – ActiveX control – ATL – Internet Programming

**TOTAL: 45 PERIODS**

**TEXT BOOK**

www.AnnaUnivEdu.Org

1. Richard C. Leinecker and Tom Archer, "Visual C++ 6 Programming Bible", Wiley DreamTech Press, 2006.

## REFERENCES

1. Lars Klander, "Core Visual C++ 6", Pearson Education, 2000

**CS2032**

**DATA WAREHOUSING AND DATA MINING**

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### **UNIT I DATA WAREHOUSING 10**

Data warehousing Components –Building a Data warehouse -- Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

### **UNIT II BUSINESS ANALYSIS 8**

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

### **UNIT III DATA MINING 8**

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.

### **UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION 11**

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Prediction

### **UNIT V CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING 8**

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods - K-means – Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

## TEXT BOOKS:

1. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, 2007.

## REFERENCES:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction To Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay, "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.

3. G. K. Gupta, " Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, "Data Mining Methods and Models", Wile-Interscience, 2006.

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