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OBJECTIVE:

- To facilitate the understanding of the principles and to cultivate the art of formulating physical problems in the language of mathematics.

OUTCOMES:

- To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow the of electric current.
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.

UNIT I MATRICES


UNIT II FUNCTIONS OF SEVERAL VARIABLES


UNIT III ANALYTIC FUNCTION

Analytic functions – Necessary and sufficient conditions for analyticity – Properties – Harmonic conjugates – Construction of analytic function – Conformal Mapping – Mapping by functions w = a + z , az, 1/z, - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION

Line Integral – Cauchy’s theorem and integral formula – Taylor’s and Laurent’s Series – Singularities – Residues – Residue theorem – Application of Residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real axis.

UNIT V LAPLACE TRANSFORMS


TOTAL: 45 PERIODS

BOOKS FOR STUDY

OBJECTIVE:
To understand the essential principles of Physics of semiconductor device and Electron transport properties. Become proficient in magnetic and optical properties of materials and Nano electronic devices.

UNIT I  ELECTRICAL PROPERTIES OF MATERIALS  9

UNIT II  SEMICONDUCTORS AND TRANSPORT PHYSICS  9

UNIT III  MAGNETIC PROPERTIES OF MATERIALS  9

UNIT IV  OPTICAL PROPERTIES OF MATERIALS  9
Classification of optical materials – Absorption in metals, insulators & Semiconductors - LED’s – Organic LED’s – Polymer light emitting materials – Plasma light emitting devices – LCD’s – Laser diodes – Optical data storage techniques (including DVD, Blue-ray disc, Holographic data storage).

UNIT V  NANO DEVICES  9

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

PTGE8151 COMPUTING TECHNIQUES L T P C
3 0 0 3

UNIT I INTRODUCTION 8

UNIT II C PROGRAMMING BASICS 10

UNIT III ARRAYS AND STRINGS 9

UNIT IV FUNCTIONS AND POINTERS 9

UNIT V STRUCTURES AND UNIONS 9
Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions – Storage classes, Pre-processor directives.

TOTAL: 45 PERIODS

TEXTBOOKS:

REFERENCES:
AIM:
The aim is to review the basics of C programming and to introduce the concepts of Data Structures.

OBJECTIVES:
- To introduce the basics of C programming language
- To introduce the concepts of ADTs
- To introduce the concepts of Hashing and Sorting

UNIT I C PROGRAMMING FUNDAMENTALS
Data types – Variables – Operations - Expression and Statements – Conditional statements – Control statements – Functions – Arrays - Preprocessor

UNIT II C PROGRAMMING ADVANCED FEATURES
Pointers - Variation in pointer declarations – Function Pointers – Function with Variable number of arguments - Structures and Unions - File handling concepts

UNIT III LINEAR DATA STRUCTURES – LIST, STACK AND QUEUE

UNIT IV NON-LINEAR DATA STRUCTURES - TREES

UNIT V SORTING AND SEARCHING TECHNIQUES

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
The aim is to introduce the concepts of structured Programming and the implementation of primitive Data Structures using structured Programming Language.

OBJECTIVES:
- To introduce the concepts of structured Programming language.
- To introduce the concepts of pointers and files
- To introduce the concepts of primitive Data Structures.
1. C Programs using Conditional and Control Statements
2. C Programs using Arrays, Strings and Pointers and Functions
3. Representation of records using Structures in C – Creation of Linked List – Manipulation of records in a Linked List
4. File Handling in C – Sequential access – Random Access
5. Operations on a Stack and Queue – infix to postfix – simple expression evaluation using stacks - Linked Stack Implementation – Linked Queue Implementation
7. Implementation of Sorting algorithms
8. Implementation of Linear search – Binary Search – Indexed Search

TOTAL: 45 PERIODS

OBJECTIVES:
At the end of this course, the student will be able to
- Perform arithmetic operations in any number system
- Use boolean simplification techniques to design a combinational hardware circuit
- Analyze a given digital circuit – combinational and sequential
- Identify different functional units in a digital computer system
- Trace execution of instruction sequence in a processor
- Explain the implementation of each functional unit

UNIT I DIGITAL FUNDAMENTALS
Number systems and conversions – Boolean algebra and simplification – Minimization Of Boolean functions – Karnaugh map – Logic gates – NAND-NOR implementation

UNIT II COMBINATIONAL AND SEQUENTIAL CIRCUITS

UNIT III BASIC STRUCTURE OF COMPUTERS
Functional units – Basic operational concepts – Instruction set architecture – Hardware/Software Interface – Addressing modes – RISC – CISC - Performance metrics - ALU design – multiplier and divider circuits
UNIT IV  PROCESSOR DESIGN  9
Fundamental concepts – Execution of a complete instruction – Hardwired control – Micro programmed control – Pipelining – Basic concepts – Data hazards – Instruction hazards – Control hazards

UNIT V  MEMORY AND I/O SYSTEMS  9
Memory Technology – Memory hierarchy – Cache Memory – Design Methods – Virtual Memory – Input/output System – Programmed I/O – DMA and Interrupts – Functions of I/O devices and interfaces

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8202  PROGRAMMING AND DATA STRUCTURES II  L T P C
3 0 0 3

AIM:
The aim is to introduce the concepts Object Oriented Programming and the implementation of Advanced Data Structures using Object Oriented Programming Language.

OBJECTIVES:
• To introduce the concepts of Object Oriented Programming language.
• To introduce the concepts of Templates and Error Handling.
• To introduce the concepts of Advanced Data Structures.

UNIT I  OBJECT ORIENTED PROGRAMMING FUNDAMENTALS  9
C++ Programming features - Data Abstraction - Encapsulation - class - object - constructors - static members – constant members – member functions – pointers – references - Role of this pointer – Storage classes – function as arguments

UNIT II  OBJECT ORIENTED PROGRAMMING CONCEPTS  9
String Handling – Copy Constructor - Polymorphism – compile time and run time polymorphisms – function overloading – operators overloading – dynamic memory allocation - Nested classes - Inheritance – virtual functions

UNIT III  C++ PROGRAMMING ADVANCED FEATURES  9
Abstract class – Exception handling - Standard libraries - Generic Programming - templates - class template - function template – STL – containers – iterators – function adaptors – allocators - Parameterizing the class - File handling concepts
UNIT IV  
ADVANCED NON-LINEAR DATA STRUCTURES  

UNIT V  
GRAPHS  

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8203 DATABASE SYSTEM CONCEPTS  
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 Storage and Query processing Techniques

UNIT I  
RELATIONAL DATABASES  

UNIT II  
APPLICATION DEVELOPMENT WITH SQL  
SQL fundamentals - Advanced SQL features – High level language extension- Iteration selection - Procedures - Functions – Parameter passing -- Triggers- Embedded SQL-- Dynamic SQL -- Database connectivity

UNIT III  
DATABASE DESIGN  
UNIT IV  TRANSACTIONS

UNIT V  IMPLEMENTATION TECHNIQUES

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTMA8201  PROBABILITY AND QUEUEING THEORY  L  T  P  C
(Branch specific course)  3  0  0  3

OBJECTIVES:
- To provide the required fundamental concepts in probability and queueing models and apply these techniques in networks, image processing etc.
- Acquire skills in analyzing queueing models.

UNIT I  RANDOM VARIABLES
Discrete and Continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal distributions - Functions of a random variable.

UNIT II  TWO-DIMENSIONAL RANDOM VARIABLES
Joint distributions – Marginal and Conditional distributions – Covariance – Correlation and Linear regression – Transformation of random variables – Central limit theorem (for independent and identically distributed random variables).

UNIT III  RANDOM PROCESSES
UNIT IV QUEUEING THEORY
Markovian queues – Birth and Death processes – Single and multiple server queueing models – Little's formula - Queues with finite waiting rooms – Finite source models.

UNIT V NON-MARKOVIAN QUEUES AND QUEUEING NETWORKS
M/G/1 queue – Pollaczek Khinchin formula - M/D/1 and M/E_k/1 as special cases – Series queues – Open and closed Jackson networks.

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8211 DATABASE MANAGEMENT SYSTEMS LABORATORY

AIM:
The aim of this laboratory is to inculcate the abilities of applying the principles of the database management systems. The course aims to prepare the students for projects where a proper implementation of databases will be required.

OBJECTIVES:
The students will be able to create a database file
The students will be able to query a database file
The students will be able to append and update a database file
• Data Definition, Manipulation of Tables and Views
• Database Querying – Simple queries, Nested queries, Sub queries and Joins
• Triggers
• Transaction Control
• Embedded SQL
• Database Connectivity with Front End Tools
• Front End Tools / Programming Languages
• High level language extensions - PL/SQL Basics
• Procedures and Functions
• Database Design and Implementation (Case Study)

TOTAL: 45 PERIODS
OBJECTIVES:
Gives an idea about process synchronization, inter-process communication, scheduling, deadlock handling, and memory management.

UNIT I OPERATING SYSTEMS OVERVIEW

UNIT II PROCESS MANAGEMENT

UNIT III STORAGE MANAGEMENT

UNIT IV I/O SYSTEMS

UNIT V CASE STUDY

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
OBJECTIVE:
To understand the structure and function of an ecosystem. To probe into various kinds of environmental pollution along with measures to control and prevent such pollution. To study the exploitation of various natural resources like Forest, Water, Land and Energy with substantial case studies. The course also enlightens on the steps taken by the Government and NGOs through the implementation of various Legislative protection acts and their impact on the environment. To study the population explosion and its impact on the environment. To focus on explaining the available Family welfare programs through the cognizance of the role of Information Technology in environment protection and human health with apt case studies.

UNIT I  ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY
Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.
Field study of common plants, insects, birds
Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II  ENVIRONMENTAL POLLUTION
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.
Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III  NATURAL RESOURCES
Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.
Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.
UNIT IV  SOCIAL ISSUES AND THE ENVIRONMENT

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
4  Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press (2005)

PTIT8351 WEB TECHNOLOGY
(Custom to CSE & IT Programmes)

AIM:
To provide an introduction to Java and basic Web concepts and enable the student to create simple Web based applications.

OBJECTIVES:
- To introduce the features of object oriented programming languages using Java
- To design and create user interfaces using Java frames and applets
- To have a basic idea about network programming using Java
- To create simple Web pages and provide client side validation
- To create dynamic web pages using server side scripting

UNIT I  JAVA FUNDAMENTALS

UNIT II  JAVA NETWORKING FUNDAMENTALS
UNIT III  CLIENT SIDE TECHNOLOGIES  9
XML - Document Type Definition - XML Schema - Document Object Model - Presenting XML

UNIT IV  SERVER SIDE TECHNOLOGIES  9

UNIT V  APPLICATION DEVELOPMENT ENVIRONMENT  9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

PTMA8351  DISCRETE MATHEMATICS  L T P C  3 0 0 3
(BRANCH SPECIFIC COURSE)

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

UNIT II  COMBINATORICS  9
UNIT III  GRAPHS  9
Graphs and graph models – Graph terminology and special types of graphs – Matrix representation of graphs and graph isomorphism – Connectivity – Euler and Hamilton paths.

UNIT IV  ALGEBRAIC STRUCTURES  9

UNIT V  LATTICES AND BOOLEAN ALGEBRA  9

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8311 WEB TECHNOLOGY LABORATORY  L T P C
0 0 3 2

AIM:
To enable the students to program in Java and to create simple Web based applications.

OBJECTIVES:
- To write simple programs using Java
- To design and create user interfaces using Java frames and applets
- To write I/O and network related programs using Java
- To create simple Web pages and provide client side validation
- To create dynamic web pages using server side scripting

4. Implementation of Servlets and JSPs – JDBC applications with JSPs - Session management – EJB implementation
5. Creation of Web Enabled applications using Struts Framework – Simple Hibernate applications – Persistence classes - Representation of Servlets and RMI using Spring framework

TOTAL: 45 PERIODS
OBJECTIVE

This course is intended to provide the students with an overall view over Software Engineering discipline and with insight into the processes of software development.

UNIT I SOFTWARE PROCESS MODELS

UNIT II REQUIREMENT ENGINEERING

UNIT III ANALYSIS MODELLING

UNIT IV DESIGN & TESTING

UNIT V QUALITY & MAINTENANCE

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
OBJECTIVES:

- At the end of this course the student will be able to
- Trace the flow of information from one node to another node in the network
- Identify the component required to build different types of networks
- Understand the division of network functionalities into layers.
- Identify solution for each functionality at each layer
- Choose the required functionality at each layer for given application

UNIT I  FUNDAMENTALS 9

UNIT II  TRANSPORT LAYER 9
Overview of Transport layer - UDP - TCP - Reliable byte stream - Connection management - Flow control - Retransmission - Congestion control - Congestion avoidance

UNIT III  NETWORK AND ROUTING 9

UNIT IV  DATA LINK LAYER AND LAN 9
Link layer services - Framing - Error control - Flow control - Media access control - Ethernet - CSMA/CD - Token Ring - FDDI - Wireless LANs - CSMA/CA

UNIT V  DATA COMMUNICATION 9
Signal characteristics - Data transmission - Physical links and transmission media - Signal encoding techniques - Channel access techniques - TDM - FDM

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE:
AIM:

- To provide knowledge on principles and practice underlying the design of distributed systems and to explain the importance of the theory of distributed systems. It is intended to provide an understanding of the concepts of distributed systems, through several existing examples.
- The student will appreciate that the design and implementation of effective distributed systems is complex: issues related to "imperfect" computation and communication makes it substantially more difficult than designing centralized algorithms. These will be highlighted in specific distributed environments such as grid and cloud.
- The subject deals with IPC and Remote invocation in distributed environment, distributed objects, distributed file system, and Distributed operating system issues, distributed transactions and security in distributed environment.

OBJECTIVES:

- To lay the foundations of Distributed Systems.
- To introduce the idea of distributed architecture and related issues.
- To introduce the idea of distributed operating system and related issues.
- To understand in detail the system level and support required.
- To study and learn how the principles are applied in grid and cloud environment.

UNIT I  COMMUNICATION IN DISTRIBUTED ENVIRONMENT  8

UNIT II  DISTRIBUTED OPERATING SYSTEMS  10

UNIT III  DISTRIBUTED RESOURCE MANAGEMENT  10

UNIT IV  FAULT TOLERANCE AND CONSENSUS  8

UNIT V  CASE STUDIES  9
Distributed Object Based System – CORBA – Distributed Virtualization System – VMWare

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

PTIT8403 INTEGRATED PROGRAMMING L T P C
3 0 0 3

OBJECTIVE:
- To know the essentials of XML Programming
- To understand programming concepts of distributed and wireless environments
- To understand the programming practices behind coordinating Distributed Architecture

UNIT I INTRODUCTION
Overview of Middleware Components - Distributed programming - XML in Web Programming - JINI fundamentals

UNIT II WORKING WITH XML
XML annotations - Custom annotations - Functions to Control XML - XML parsers - XML data sources - XML Validation - XSLT transformation and programming -XML processing using PHP

UNIT III DISTRIBUTED PROGRAMMING
Multithreaded Programming - Synchronization techniques - Java Threading model - Multiple process programming: Sockets - Messaging - Client-Server model - RPC - CORBA and DCOM models of RPC - Reusable Programming Techniques

UNIT IV PROGRAMMING THE WIRELESS DEVICES
J2ME - Connected Limited Device Configuration - Mobile Information Device Profile - UI controls - Event Handling - Persistent Storage - Network Midlets - Wireless Messaging

UNIT V JINI PROGRAMMING
Plug-and-Work model - Lookup Services - Discovery Protocol - Proxy Objects - Leases - Attributes - Groups - JINI with RMI - JINI with J2ME

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
To understand the low-level network programming concepts using APIs and Simulation tools.

OBJECTIVES:
- Write a network application program
- Exercise all options of TCP/UDP sockets
- Use tools to visualize packet flow
- To analyze the performance of protocols in different layers using simulation tools
- Configure Router/Switch to set up network (network administration)
- Simple Chat Program using TCP Sockets
- Simulation of HTTP Protocol using TCP Sockets
- Simulation of Sliding Window Protocol using TCP Sockets
- Simulation of DNS using UDP Sockets
- Simulation of Ping using Raw Sockets
- Learn to use commands like TCP Dump, Netstat, TraceRoute
- Develop applications and understand the behaviour of TCP Options.
- Study of TCP/UDP performance using simulation tool
- Performance comparison of MAC protocols using simulation tool
- Performance comparison of Routing protocols using simulation tool
- Study and configure functionalities of a router and switches (or by simulation)

TOTAL: 45 PERIODS

OBJECTIVE
Gives and understanding of OOAD basics, UML diagrams, system modeling, design based on requirements, converting design to code, and design patterns.

UNIT I OOAD BASICS

UNIT II REQUIREMENTS & MORE MODELING

UNIT III DESIGN AND PRINCIPLES OF DESIGN

UNIT IV MAPPING TO CODE
Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint
UNIT V  MORE PATTERNS

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8501  MOBILE COMPUTING
L  T  P  C
3  0  0  3

AIM:
• To give a comprehensive exposure to the developments taking place in the areas of wireless networks and mobile computing

OBJECTIVES:
• To understand the challenges of wireless communication and the solutions that are in use
• To study about various types of wireless data networks and wireless voice networks
• To realize the role of wireless protocols in shaping the future Internet
• To design and implement mobile applications
• To give an introduction to the enabling technologies of pervasive computing

UNIT I  WIRELESS COMMUNICATION

UNIT II  WIRELESS NETWORKS

UNIT III  L3 AND L4 WIRELESS PROTOCOLS
Mobile IP - Mobility features in IPv6 - Proactive and reactive ad hoc routing protocols - DSDV, DSR and AODV - Limitations of Traditional TCP in wireless networks - TCP improvements for Wireless Networks – Indirect TCP, Snoop TCP, Mobile TCP - Security issues in network layer and transport layer
UNIT IV  MOBILE COMPUTING PLATFORM  9
PDA - Device characteristics and Software components - Smart Phone - Convergence of Mobile devices - J2ME - Modes, Data store, GUI support - HTTP Connection Interface Push Registry - Application development using Android APIs - Palm OS Architecture and Program Development - Overview of other mobile Operating Systems

UNIT V  MOBILE INTERNET  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:

PTIT8511  MOBILE COMPUTING LABORATORY  L T P C 0 0 3 2

OBJECTIVE:
• To understand and use the fundamentals of programming for mobile devices.
• To apply event-driven programming and graphical user interfaces for mobile devices.

1. GSM modem study (Nokia 30) and
2. SMS client-server application
3. Implementation of Mobile Network using Network Simulator (NS2)
4. GUI APIs for high-level and low level programming
5. To store and access information stored in a mobile device (persistence and record management)
6. Usage of HTTP and sockets for communication between mobile devices and remote servers.
7. Mobile Internet and WML
8. J2ME Program for Mobile Node Discovery
9. Mobile protocol study using simulator
10. To design sample programs for Mobile Phones. (Android, iPhone etc)
11. Bluetooth Integration

TOTAL: 45 PERIODS
OBJECTIVE:
This course deals with evolving multidimensional massive data sets and the various analysis which may be performed on it.

UNIT I INTRODUCTION TO BIG DATA

UNIT II DATA ANALYSIS

UNIT III MINING DATA STREAMS

UNIT IV FREQUENT ITEMSETS AND CLUSTERING

UNIT V FRAMEWORKS AND VISUALIZATION
MapReduce – Hadoop, Hive, MapR – Sharding – NoSQL Databases - S3 - Hadoop Distributed file systems – Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications:

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
To provide an insight in the management of information in the corporate.

OBJECTIVE
- To aware the significant of information in the business scenario
- To familiarize method of restoring, retrieving and presenting the information.

UNIT I INTRODUCTION
Data, information, knowledge and wisdom; characteristics of information, quality of information, value of information in decision making in various levels of the organization Role of information in Business scenario - functional and process approach in the organization; Source and supply of information and content to employees, shareholders and customers

UNIT II INFORMATION CAPTURING AND MIGRATION MECHANISMS
Data management and system integration: Content management – text, imaging, records, workflow, web content management; Distributed databases, Object oriented databases, object life cycle modeling, visual databases and knowledge based databases and business impacts, ETL on data warehouse, Meta data and indexing

UNIT III BUSINESS PROCESS MANAGEMENT
Practices of BPM, role of Information in BPM, Business Analysis-relationship between information and organization, Critical success factors, Enterprise analysis, framework and tools, Process design and modeling-process improvements, process modeling, business process reengineering, SOA, Six Sigma and continuous improvement, ERP.

UNIT IV INFORMATION PRESENTATION
Enterprise wide search-DSS, EIS, ES, Fact and entity extraction - OLAP, Data mining algorithm - classification and clustering of information, information governance, BI

UNIT V INFORMATION IN BUSINESS SCENARIO AND BUSINESS TRENDS
Information in management application: Functional areas of management, roles and responsibilities of Information resource manager, E business models, Value of information in E-CRM - Social marketing – social and ethical issues in handling information management.

TOTAL: 45 PERIODS

REFERENCES:
OBJECTIVES:
- To study about the design, implementation and evaluation of effective and usable graphical computer interfaces.
- To describe and apply core theories, models and methodologies from the field of HCI.
- To learn various case studies in HCI

UNIT I  FOUNDATIONS FOR INTERACTION DESIGN  9

UNIT II  MODELS AND THEORIES  9

UNIT III  DESIGN PROCESS  9

UNIT IV  IMPLEMENTATION AND EVALUATION TECHNIQUES  9
Implementation support: Elements of windowing systems - Programming the application- Using toolkits-User interface management systems, Evaluation techniques: Goals of evaluation-Evaluation through user participation-Choosing and evaluation method, Universal design: Universal design principles-Multi model interaction-Designing for diversity, User support: Requirements of user support-Approaches to user support-Adaptive help systems-Designing user support systems.

UNIT V  CASE STUDIES  9
Goals of HCI case studies: Exploration - Explanation - Description - Demonstration, Types of case study: Intrinsic or instrumental - Single case multiple cases - Embedded or holistic, Groupware: Groupware systems - Computer mediated communication - Meeting and decision support system - Shared applications and artifacts - Frameworks for groupware - Implementing synchronous groupware, Ubiquitous computing and augmented realities: Ubiquitous computing applications research - Virtual and augmented reality - Information and data visualization - HCI for smart environment – Virtual reality – HCI for scientific applications, medical applications – HCI for assisitive technology

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
OBJECTIVE:
- To design and create effective user interfaces for various applications.
- To create interactive animated displays using various interactive devices.

2. Modifying the user interfaces of text processor, Excel, Power point builder.
3. Designing interfaces for health care, telephone directory and collaborative applications using tools like Cog tool, Flash builder.
4. Creating user interfaces for disabled people using speech engines, translators and sign language.
5. Working on Multi touch devices and multi sensor devices
6. Design of interactive devices like cell phones and video controllers, household appliances and smart cars.
7. Drag and Drop an application instance from server to client and then automate the execution of the application on the client side (JAVA / VC++)
8. Simulate the Smart Car display to view the availability of petrol in the tank, distance travelled and a graphic display (continuous monitoring) with different colors about the level of petrol in the tank
9. To drag the magnifying lens on the world map just to zoom the region of interest and to collect the retrieve the relevant information about that region

TOTAL: 45 PERIODS

UNIT I

SECURITY - AN OVERVIEW

UNIT II

CRYPTOGRAPHY
Classical Cryptosystems - Substitution and Transposition - Blowfish and AES - Public Key Cryptography - RSA and ElGamal algorithms - Authentication and Key Exchange - Biometric authentication - Diffie Hellman and Needem Schroeder algorithms - Digital Signatures - Message Digest - Certificates - Directories and Revocation of keys and certificates
UNIT III SECURITY STANDARDS

UNIT IV SECURITY PRACTICES

UNIT V SECURED DEVELOPMENT

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTCS8021 DIGITAL SIGNAL PROCESSING – ALGORITHMS AND APPLICATIONS

OBJECTIVE
This course provides the idea on design of analog and digital filters, and their classifications. Also, it provides a good knowledge of error correction in signal processing systems, which is then enriched with the applications to the image and speech processing.

UNIT I SIGNALS AND SYSTEMS

UNIT II FREQUENCY TRANSFORMATIONS

UNIT III IIR FILTER DESIGN
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (LPF, HPF, BPF, BRF) filter design using frequency translation

UNIT IV FIR FILTER DESIGN
UNIT V APPLICATIONS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
OBJECTIVE
To get subsequent understanding of game design and development, which includes the processes, mechanics, issues in game design, game engine development, modeling, techniques, handling situations, and logic. At the end, the student will be in a position to create interactive games. To learn this course an exposure to 3D graphics principles and animation techniques are the prerequisite.

UNIT I 3D GRAPHICS FOR GAME PROGRAMMING 9
Coordinate Systems, Ray Tracing, Modeling in Game Production, Vertex Processing, Rasterization, Fragment Processing and Output Merging, Illumination and Shaders, Parametric Curves and Surfaces, Shader Models, Image Texturing, Bump Mapping, Advanced Texturing, Character Animation, Physics-based Simulation

UNIT II GAME DESIGN PRINCIPLES 9
Character development, Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection, Game Logic, Game AI, Path Finding

UNIT III GAMING ENGINE DESIGN 9
Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics

UNIT IV GAMING PLATFORMS AND FRAMEWORKS 9
Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, iOS, Game engines - Adventure Game Studio, DXStudio, Unity

UNIT V GAME DEVELOPMENT 9
Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
6. Andy Harris, “Beginning Flash Game Programming For Dummies”, For Dummies; Updated edition, 2005.
OBJECTIVE:
To build and implement a small ontology that is semantically descriptive of your chosen problem domain, implement applications that can access, use and manipulate the ontology, represent data from a chosen problem in XML with appropriate semantic tags obtained or derived from the ontology, depict the semantic relationships among these data elements using Resource Description Framework (RDF), design and implement a web services application that “discovers” the data and/or other web services via the semantic web (which includes the RDF, data elements in properly tagged XML, and the ontology), discover the capabilities and limitations of semantic web technology for different applications.
TEXT BOOKS:

REFERENCES:

PTCS8075 UNIX internals 
(0bjective to CSE & IT Programmes) 
L T P C 3 0 0 3

OBJECTIVE
To provide knowledge about Unix operating system working principles, its file system and programming for interprocess communication. It also gives an understanding for using various system calls.

UNIT I OVERVIEW

UNIT II FILE SUBSYSTEM
Internal representation of files: Inodes – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super block – Inode assignment to a new file – Allocation of disk blocks

UNIT III SYSTEM CALLS FOR THE FILE SYSTEM

UNIT IV PROCESSES
UNIT V  MEMORY MANAGEMENT AND I/O  

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES:

PTIT8001  ADVANCED DATABASE TECHNOLOGY  
L T P C  3 0 0 3

OBJECTIVE:
- To know advanced concepts of database in large scale analytics
- To derive data maintenance, change schema, database update and Benchmark
- To understand Object Databases and to deal with uncertainties in advanced concepts of database, and open issues in database technologies.

UNIT I  PARALLEL AND DISTRIBUTED DATABASES  
Database System Architectures: Centralized and Client-Server Architectures - Server system architectures - Parallel systems - Distributed systems - Parallel databases: I/O Parallelism - Inter and Intra query parallelism - Inter and Intra operation parallelism - Distributed database concepts - Distributed data storage - Distributed transactions - Commit protocols - Concurrency control - Distributed query processing - Three tier client server architecture - Case studies

UNIT II  OBJECT AND OBJECT RELATIONAL DATABASES  

UNIT III  XML DATABASES  
XML Databases: XML data model - DTD - XML Schema - XML querying - Web databases - JDBC - Information retrieval - Data warehousing - Data mining

UNIT IV  MOBILE DATABASES  
Mobile Databases: Location and Handoff Management - Effect of mobility on data management - Location dependent data distribution - Mobile transaction models - Concurrency control - Transaction commit protocols - Mobile database recovery schemes
UNIT V INTELLIGENT DATABASES

Active databases - Deductive databases - Knowledge databases - Multimedia databases - Multidimensional data structures - Image databases - Multimedia database design - Text/Document databases - Audio databases - Video databases

TOTAL: 45 PERIODS

REFERENCE BOOKS:

TEXT BOOKS:

PTIT8002 ADVANCED NETWORKS

OBJECTIVES:
- To explain QoS requirements and compare different approaches to QoS.
- To appreciate need for high speed networks
- To identify reliability issues and provide solutions

UNIT I INTERNETWORKING

UNIT II MPLS AND VPN

UNIT III QUALITY OF SERVICE
Application requirements - VOIP - RT video conferencing - Entertainment video - QoS taxonomy - Resource allocation - Scheduling - Queuing disciplines - Integrated services - Differentiated services - RSVP

UNIT IV OPTICAL NETWORKS
Optical network architecture: Next Generation optical networks - Regional optical metro networks – Switching: MPLS controlling optical switches - Optical packet switching - Signaling protocols and network operation

UNIT V WDM NETWORKS
WDM: Traffic grooming in WDM - Network survivability - Survivability techniques for optical WDM Networks - Restoration Strategies in optical WDM networks - Network provisioning services

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCE:

PTIT8003 AGENT BASED INTELLIGENT SYSTEMS L T P C 3 0 0 3

OBJECTIVE:
- To know the intelligent agents and the associated searching algorithms
- To understand the various learning approaches and creation of neural network
- To understand the concepts of fuzzy logic

UNIT I AGENTS AND SEARCHING 9

UNIT II RESOLUTION AND REASONING 9
Proportional case - Handling variables and qualifiers - Dealing with intractability - Reasoning with horn clauses - Procedural control of reasoning - Rules in production – Description logic - Vivid knowledge – Beyond vivid

UNIT III NEURAL NETWORKS 9
Machine Learning using Neural Network - Adaptive networks - Feed forward networks - Supervised learning Neural Networks - Radial basis function networks - Reinforcement learning - Unsupervised learning Neural Networks - Adaptive resonance architectures - Advances in Neural Networks

UNIT IV FUZZY LOGIC 9
Fuzzy sets - Operations on Fuzzy sets - Fuzzy relations - Membership functions - Fuzzy rules and Fuzzy reasoning - Fuzzy inference systems - Fuzzy Expert Systems - Fuzzy decision making

UNIT V DEFAULTS, UNCERTAINTY AND EXPRESSIVENESS 9
Introduction to defaults - Closed world reasoning – Circumscription - Default logic limitations - Fuzzy logic - Non-monotonic logic - Theories and world - Semiotics – Autoepistemic logic - Vagueness – Uncertainty and degrees of belief – Non categorical reasoning – Objective and subjective probability

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
2. Ronald Brachman, Hector Levesque “Knowledge Representation and Reasoning “, The Morgan Kaufmann Series in Artificial Intelligence 2004
PTIT8005    C# AND .NET PROGRAMMING    L T P C
3 0 0 3

OBJECTIVE:
Understand the concept of .NET framework, study the different techniques of security, introduce web services with ASP.NET, and explore window based applications.

UNIT I    C# LANGUAGE BASICS   9
C# and the .NET framework - C# basics - Objects and types - Inheritance - Arrays - Operators and casts - Indexes

UNIT II    C# ADVANCED FEATURES   9
Delegates and events - Strings and regular expressions - Generics - Collections - Memory management and pointers - Errors and exceptions

UNIT III    BASE CLASS LIBRARIES AND DATA MANIPULATION   9
Tracing and events - Threading and synchronization - .Net security - Localization - Manipulating XML - Managing the file system - Basic network programming

UNIT IV    DATABASE AND WEB SERVICES   9
Window based applications - Data access with .NET - basics of ASP .NET - Introduction to web services

UNIT V    .NET FRAMEWORK   9
Architecture - Assemblies - Shared assemblies - CLR hosting - Appdomains – Reflection

TOTAL:45 PERIODS

TEXT BOOK:

REFERENCES:

PTIT8006    CLOUD COMPUTING    L T P C
3 0 0 3

OBJECTIVE:
- To understand the concept of cloud and utility computing
- To understand the various issues in cloud computing
- To familiarise themselves with the lead players in cloud
- To appreciate the emergence of cloud as the next generation computing paradigm
- To be able to set up a private cloud
  At the end of this course the student should be able to
- Appreciate the new computing model called cloud computing and why its creating such a hype in the 21st century;
- Use the open source cloud services;
- Understand that one of the major issues in usage of public cloud is security;
- Is expected to deploy a private cloud and understand the issues currently prevailing.
UNIT I  
INTRODUCTION  
Evolution of cloud computing – Need for cloud computing - Benefits - Limitations - Migration into Cloud - Basics of virtualization - Desktop virtualization - Server virtualization - Case study: VMware - Basics of web services - Key concepts  

UNIT II  
CLOUD ARCHITECTURE  

UNIT III  
ISSUES IN CLOUD  
Federation in cloud - Four levels of federation - Privacy in cloud - Security in cloud - Software-as-a-Service security - Case study: Aneka - Service level agreements  

UNIT IV  
CLOUD STORAGE  
Overview of cloud storage - Cloud storage providers - Case studies: Walrus - Amazon S3 - Cloud file system – Map Reduce - Case study: Hadoop  

UNIT V  
CLOUD DEPLOYMENT TOOLS  
Study of open source cloud platforms - Eucalyptus - Nimbus - Open Nebula  

TOTAL: 45 PERIODS  

TEXT BOOKS :  

REFERENCES:  
7. www.open.eucalyptus.com/  
9. www.nimbusproject.org  

OBJECTIVE:  
To design the front end of the compiler, scanner, parser, intermediate code generator, object code generator, and the parallel compilation strategies
UNIT I  LEXICAL ANALYSIS  9
Introduction to Compiler: Compilers - Analysis of the Source Program - The phases of compiler - Compiler construction tools - Lexical analyzer - Input buffering - Specification of tokens - Recognition of tokens - A language for specifying lexical analyzer

UNIT II  SYNTAX ANALYSIS AND RUN-TIME ENVIRONMENTS  9
Syntax Analysis: The role of the parser - Context-free grammars - Writing a grammar - Top down parsing - Bottom-up parsing - LR parsers - Constructing SLR parsing table - Type checking - Type systems - Specification of a simple type checker - Run-time Environments - Source language issues - Storage organization - Storage-allocation strategies.

UNIT III  INTERMEDIATE CODE GENERATION  9
Intermediate languages – Declarations - Assignment statements - Boolean expressions – Flow of Control statements - Back patching - Procedure calls

UNIT IV  CODE GENERATION  9
Issues in the design of a code generator - Target machine - Run-time storage management - Basic blocks and flow graphs - Next-use information - Simple code generator - Register allocation and assignment - The DAG representation of basic blocks - Generating code from DAGs

UNIT V  CODE OPTIMIZATION  9
Principle sources of optimization - Peephole optimization - Optimization of basic blocks - Loops in flow graphs - Introduction to global data-flow analysis - Code improving transformations

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

PTIT8008  COMPUTATIONAL LINGUISTICS  L T P C
3 0 0 3

AIM:
• The aim of this course is to provide an introduction to some basic Language Technologies. The course also provides an overview of Text mining and applications of language processing.

OBJECTIVES:
• To understand the statistical modeling and classification for NLP.
• To understand the basic techniques of Information Retrieval.
• To understand the basic of Text mining and techniques of text mining.
• To know about the generic issues in speech processing and application relevant to Natural Language Generation.
UNIT I  NATURAL LANGUAGE PROCESSING  9
Linguistic background - Spoken language input and output technologies - Written language input - Mathematical methods - Statistical modeling and classification - Finite state methods: Grammar for natural language processing - Parsing - Semantic interpretation: Semantics and logical form - Ambiguity resolution – Other strategies for semantic interpretation

UNIT II  INFORMATION RETRIEVAL  9
Information Retrieval architecture - Indexing - Storage - Compression techniques - Retrieval approaches - Evaluation - Search engines - commercial search engine features – comparison - performance measures - Document processing - NLP based Information Retrieval - Information extraction

UNIT III  TEXT MINING  9
Categorization: Extraction based Categorization - Clustering - Hierarchical clustering - Document classification and routing - Finding and organizing answers from Text search - Categories and clusters for organizing retrieval results - Text Categorization - Efficient summarization using lexical chains - Pattern extraction

UNIT IV  GENERIC ISSUES  9

UNIT V  APPLICATIONS  9
Machine translation - Transfer metaphor - Interlingua and statistical approaches - Discourse processing - Dialog and conversational agents - Natural language generation - Surface realization and discourse planning

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

OBJECTIVE
This course comprehends the graphs as a modeling and analysis tool in computer science & Engineering. It introduces the structures such as graphs & trees and techniques of counting and combinations, which are needed in number theory based computing and network security studies in Computer Science.
UNIT I INTRODUCTION

UNIT II TREES, CONNECTIVITY & PLANARITY

UNIT III MATRICES, COLOURING AND DIRECTED GRAPH

UNIT IV PERMUTATIONS & COMBINATIONS
Fundamental principles of counting - Permutations and combinations - Binomial theorem - combinations with repetition - Combinatorial numbers - Principle of inclusion and exclusion - Derangements - Arrangements with forbidden positions.

UNIT V GENERATING FUNCTIONS
Generating functions - Partitions of integers - Exponential generating function - Summation operator - Recurrence relations - First order and second order – Non-homogeneous recurrence relations - Method of generating functions.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT III  PATENTS

UNIT IV  COPYRIGHTS, TRADEMARKS AND OTHER IPR
Copyrights - salient features of Copyright Act - rights conferred by copyright - infringement and remedies - Trademark - rights arising from registration - offences and penalties - Definitions - Industrial designs and Integrated circuits - Protection of Geographical indications - Plant varieties and farmer's rights - Application Procedures, Trade secret - Case studies.

UNIT V  IPR IN THE CYBER WORLD:
Introduction and overview - emergence of cyber crime - software piracy - software copyright and patent - Trademark issues. related to Internet - data protection in cyberspace IPR provisions in Information Technology Act.

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
5. Elizabeth Verkey, Law of Plant Varieties Protection, Eastern Book Company,

PTIT8015 KNOWLEDGE ENGINEERING

OBJECTIVE
• To understand knowledge representation and reasoning techniques
• To understand logics and planning

UNIT I  INTRODUCTION
Key concepts - Knowledge representation and reasoning - Language of first order logic - Syntax, Semantics, Pragmatics - Expressing Knowledge - Levels of representation - Knowledge acquisition and sharing - Sharing Ontologies - Language Ontologies - Language patterns - Tools for knowledge acquisition

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UNIT II RESOLUTION AND REASONING
Proportional case - Handling variables and qualifiers - Dealing with intractability - Reasoning with horn clauses - Procedural control of reasoning - Rules in production - Description logic

UNIT III REPRESENTATION
Semantic networks - Object Oriented representations - Frame formalism - Structured descriptions - Meaning and Entailment - Taxonomies and Classification - Inheritance - Networks - Strategies for defensible inheritance - Formal account of Inheritance networks - Conceptual dependency - Scripts

UNIT IV DEFAULTS, UNCERTAINTY AND EXPRESSIVENESS
Defaults - Introduction - Closed world reasoning - Circumscription - Default logic - Limitations of logic - Fuzzy logic - Nonmonotonic logic - Theories and World - Semiotics - Auto epistemic logic - Vagueness uncertainty and Degrees of belief - Noncategorical reasoning - Objective and Subjective probability

UNIT V ACTIONS AND PLANNING

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

PTIT8017 MOBILE APPLICATION DEVELOPMENT

OBJECTIVE
- To know the mobile architecture and its standards
- To develop various applications using mobile devices

UNIT I INTRODUCTION
Mobile application fundamentals - Characteristics - Benefits - History of mobiles - Mobile framework - Devices – Platform - Operating systems - Application framework - Overview of types of mobile applications

UNIT II APPLICATION DESIGN
Mobile Information Architecture: Click streams - Wireframes - Prototyping – Mobile design - Design elements - Design tools - Design principles - Mobile Web Vs Native applications - Device testing - Desktop testing - Usability testing

UNIT III WEB STANDARDS
Overview of Mobile 2.0 - Web Standards - Designing for multiple mobile browsers - Markup languages - Cascading Style Sheets - JavaScript for mobile application development
UNIT IV   APPLICATION DEVELOPMENT IN MOBILE DEVICES  9
Native Android and iPhone applications - Android Vs iPhone SDK features - Open handset alliance - Development framework - Android Vs iPhone development tools - Creating applications and activities - Creating user interfaces

UNIT V   ADVANCED APPLICATION DEVELOPMENT IN MOBILE DEVICES  9
Internets - Broadcast Receivers - Adapters - Internet - Data Storage - Retrieval and Sharing - Working in the background - Peer to Peer communication - Accessing Android hardware

TOTAL : 45 PERIODS

TEXT BOOKS:

PTIT8019   NETWORK PROGRAMMING AND MANAGEMENT  L T P C
Objective
• To learn the basics of socket programming using TCP Sockets.
• To learn about Socket Options
• To learn to develop Macros for including Objects In MIB Structure
• To understand SNMPv1, v2 and v3 protocols & practical issues.

UNIT I   SOCKETS AND APPLICATION DEVELOPMENT  9
Introduction to Socket Programming - System Calls - Address conversion functions - 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 -TCP echo client/server with I/O Multiplexing

UNIT II   SOCKET OPTIONS  9
Socket options - getsockopt and setsockopt functions - Generic socket options - IP socket options - ICMP socket options - TCP socket options - Multiplexing TCP and UDP sockets - SCTP Sockets - SCTP Client/server - Streaming Example - Domain name system - gethostbyname, gethostbyaddr, getservbyname and getservbyport functions - Protocol Independent functions in TCP Client/Server Scenario

UNIT III   ADVANCED SOCKETS  9
IPv4 and IPv6 interoperability - Threaded servers - Thread creation and termination - TCP echo server using threads - Mutex - Condition variables - Raw sockets - Raw socket creation - Raw socket output - Raw socket input - ping program - traceroute program

UNIT IV   SIMPLE NETWORK MANAGEMENT  9

UNIT V   SNMP V2, V3 AND RMON  9
Introduction to SNMPv2 - SMI for SNMPV2 - Protocol - SNMPv3 - Architecture and applications - Security and access control model - Overview of RMON

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOK:

PTIT8023 SERVICE ORIENTED ARCHITECTURE CONCEPTS AND DESIGN

AIM
To provide an overview of Service Oriented Architecture and enable the student to create applications in a collaborative environment.

OBJECTIVES:
- To study the importance of Service Oriented Architecture
- Implementation of SOA in the Java and .Net frameworks
- To study the advanced features of SOA

UNIT I SOA FUNDAMENTALS

UNIT II SOA AND WEB SERVICES

UNIT III SERVICE ORIENTED ANALYSIS AND DESIGN
Design principles - Business Centric SOA - Deriving Business services - Service Modeling - Coordination - Atomic Transaction - Business activities - Web Service Orchestration - Choreography - Entity centric business service design - Application Service design - Task centric business service design

UNIT IV WEB SERVICES DEVELOPMENT AND DEPLOYMENT
XML and Web Services - WSDL basics - SOA support in J2EE - Java API for XML-based Web Services (JAX-WS) - Java Architecture for XML Binding (JAXB) - Java API for XML Registries (JAXR) - Web Services Interoperability Technologies - SOA support in .NET - Common Language Runtime - ASP.NET - Web forms - ASP.NET Web Services - Web Services Enhancements

UNIT V SOA APPLICATIONS AND SECURITY

TOTAL: 45 PERIODS
REFERENCES:

PTIT8024 SOCIAL NETWORK ANALYSIS L T P C 3 0 0 3

OBJECTIVE
- To introduce the concept of semantic web and related applications
- To represent knowledge using ontology
- To understand human behaviour in social web and related communities
- To visualize social networks

UNIT I INTRODUCTION 9

UNIT II MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION 9

UNIT III EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS 9
UNIT IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8025 SOFT COMPUTING L T P C
3 0 0 3

OBJECTIVES:
- To give students a detailed understanding of soft computing and understanding the need for soft computing.
- To develop skills in neural networks, genetic algorithms and Fuzzy logic.
- To develop skills to apply soft computing paradigms in real time software projects.

UNIT I INTRODUCTION TO SOFT COMPUTING

UNIT II GENETIC ALGORITHMS
Fundamentals - Genetic Operators - Sample genetic algorithms - Applications of Genetic Algorithms

UNIT III NEURAL NETWORKS
UNIT IV  FUZZY LOGIC  9
Fuzzy sets - Operations on Fuzzy sets - Fuzzy relations - Membership functions - Fuzzy rules and reasoning - Fuzzy Inference systems - Fuzzy Expert systems - Fuzzy decision making

UNIT V  NEURO-FUZZY MODELING  9
Adaptive Neuro-Fuzzy Inference Systems - Coactive Neuro-Fuzzy Modeling - Classification and Regression trees - Data Clustering algorithms - Rule based Structure identification - Neuro-Fuzzy control - Case study

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8028  SOFTWARE PROJECT MANAGEMENT  L T P C  3 0 0 3

OBJECTIVES:
- To develop an awareness of the need for project planning and management
- To apply professional attitudes and techniques to managing a project
- Explain the stages in the system development lifecycle and the activities that are carried out to implement an IT application;
- Demonstrate an understanding of steps needed to build and maintain effective development teams;
- Explain the procedures needed to monitor, control and report upon an IT development project;
- Discuss and where appropriate apply the principles of project risk management.
- Explain the ways in which appropriate quality attributes of the products of an IT development project can be assessed and assured.

UNIT I  FUNDAMENTALS  9
Conventional software management - Evolution of software economics - Improving software economics - Conventional Vs Modern software project management.

UNITII  SOFTWARE MANAGEMENT PROCESS FRAMEWORK  9
Lifecycle phases - Artifacts of the process - Model based software architectures - Workflows of the process - Checkpoints of the process.
UNIT III SOFTWARE MANAGEMENT DISCIPLINES 9
Iterative process planning - Organization and Responsibilities - Process automation - Process control and process instrumentation - Tailoring the process. Project planning - Scheduling - Tracking and Control - Time and Cost overruns - Project organization - Staffing - Group working - Team dynamics.

UNIT IV MANAGED AND OPTIMIZED PROCESSES 9

UNIT V CASE STUDIES 9
COCOMO Cost estimation model - Change metrics - Case studies

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8031 SOFTWARE TESTING L T P C 3 0 0 3

OBJECTIVES
• This objective of the course is to make students aware about the importance of the software testing during software development.
• Understand the theoretical aspects of software testing
• To study traditional static and dynamic analyses, such as data-flow, slicing, and profiling, along with promising techniques such as model checking and abstract interpretation
• To study traditional applications of these analyses, such as validation, program understanding, and debugging as well as new applications, such as security and component-based systems
• To extend understanding of software testing – its application and management – its key disciplines – and to enhance awareness of issues and constraints around testing

UNIT I BASICS OF SOFTWARE TESTING 9
Human errors and testing - Software quality - Requirements - Behavior and Correctness - Correctness Vs Reliability - Testing and Debugging - Test metrics - Software and Hardware testing - Testing and Verification - Defect management - Execution history - Test-generation strategies - Static testing - Model based testing and Model checking - Control flow Graph - Types of testing - Saturation effect - Testing axioms - Origins of defects - Cost of defects - Defect classes - Defect repository and Test design - Defect examples - Developer / Tester support - Defect prevention strategies
UNIT II  TEST CASE DESIGN  9
Design strategies - Black box approach - Random testing - Requirements based testing - Boundary value analysis - Decision tables - Equivalence class partitioning – State based testing - Cause-effect graphing - Error guessing - Compatibility testing - User documentation testing - Domain testing - White box approach - Test adequacy criteria - Static testing Vs Structural testing - Code functional testing - Coverage and control flow graphs - Covering code logic - Paths - Role in White box based test design - Code complexity testing

UNIT III  TEST CASE SELECTION AND ADEQUACY TEST EXECUTION  9
Overview - Test specification and cases - Adequacy criteria - Comparing criteria - Overview of test execution - Test case specification to cases - Scaffolding - Generic Vs specific scaffolding - Test Oracles - Self-checks as Oracles - Capture and replay - Process: Test and analysis activities - Quality process - Planning and Monitoring - Quality goals - Dependability properties - Analysis - Testing - Improving the process - Organizational factors - Integration testing strategies - Testing components and assemblies - System testing - Acceptance testing - Usability - Regression testing - Regression test selection techniques - Test case prioritization and selective execution

UNIT IV  TEST MANAGEMENT  9
People and organizational issues in testing - Organization structures for testing teams - Testing services - Test planning - Test plan components - Test plan attachments - Locating test items - Test management - Test process - Reporting test results - Role of three groups in test planning and policy development - Test specialist - Skills - Building a testing group.

UNIT V  TEST AUTOMATION  9
Software test automation - Skills - Scope - Design and architecture for automation - Requirements for a test tool - Challenges in automation - Test metrics and measurements - Project progress and productivity metrics

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8033  WIRELESS SENSOR AND MESH NETWORKS  L T P C
3 0 0 3

OBJECTIVES:
At the end of this course the student will be able to
- Explore the state-of-art in sensor and mesh networks
- Understand the specific design challenges for sensors and mesh.
- Identify solution for each applications such as environmental monitoring, home automation
- List protocols suitable for a given task satisfying the performance metric
UNIT I  INTRODUCTION AND NETWORKING SENSORS  9
Challenges for WSN - Single node architecture - Energy consumption - Energy scavenging
   techniques - Operating systems - TinyOS network architecture - Network scenarios -
   Adaptation of MAC protocols - SMAC - Low duty Cycle Protocols and Wakeup Concepts -
   SMAC  802.15.4 MAC - Zigbee

UNIT II  SYNCHRONIZATION AND LOCALIZATION  9
Time synchronization - calibration - classes - Techniques of Synchronization, Localization
   Issues - Centralized and Distributive algorithm - Multilateration Positioning tracking Topology
   Construction - MST- RNG - GG - Delaunay Triangulation Connectivity Metric

UNIT III  ROUTING AND QUERIYING  9
Routing Protocols - Energy-Efficient Routing - Geographic Routing - Data Centric Routing -
   In-Network Aggregation - Storage and Retrieval - Range Query - KD Tree -Range Tree -
   Location Service

UNIT IV  MESH NETWORKING  9
Necessity for Mesh Networks - Adaptive Coding and Radio Technologies, MAC
   enhancements - IEEE 802.11s, IEEE 802.16 MAC in Mesh mode Single Radio and Multi
   Radio MAC protocol - Mobility and Power Management - Topology Control

UNIT V  MESH ROUTING AND CASE STUDY  9
Routing Metrics – Categories - Opportunistic Routing - Self Configuration and Auto
   Configuration - Cross layer routing - Capacity Models - Heterogeneous Mesh Networks -
   Vehicular Mesh Networks - Case Study

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8071  DIGITAL IMAGE PROCESSING  L T P C
(Common to CSE & IT Programmes)  3 0 0 3

OBJECTIVE:
This course gives the knowledge of effectively storing images, extracting interesting patterns
from an image, discriminate between different classes of images, and mathematical
fundamentals for image processing. This may lead to the confidence in developing image-
processing applications.
UNIT I FUNDAMENTALS OF IMAGE PROCESSING 9
Introduction - Steps in image processing systems - Image acquisition - Sampling and Quantization - Pixel relationships - Color 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

UNIT V APPLICATIONS OF IMAGE PROCESSING 9
Image classification - Image recognition - Image understanding - Video motion analysis - Image fusion - Steganography - Digital compositing - Mosaics - Color image processing

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTIT8072 FREE AND OPEN SOURCE SOFTWARE (Common to CSE & IT Programmes) L T P C
3 0 0 3

OBJECTIVE:
To provide exposure in FOSS and to develop open source software for society.

UNIT I PHILOSOPHY 6
Linux,GNU and Freedom, Brief history of GNU, Licensing free software – GPL and copy Left, trends and potential – global and Indian, overview and usage of various Linux Distributions – user friendliness perspective – scientific perspective

UNIT II SYSTEM ADMINISTRATION 10
GNU and Linux installation – Boot process, Commands Using bash features, The man pages, files and file systems, File security, Partitions, Processes, Managing processes, I/O redirection, Graphical environment, Installing software, Backup techniques

UNIT III FOSS PROGRAMMING PRACTICES 10
GNU debugging tools, Using source code versioning and managing tools, Review of common programming practices and guidelines for GNU/Linux and FOSS, Documentation
UNIT IV    PROGRAMMING TECHNIQUES
Application programming – Basics of X Windows server architecture – QT programming –
GTK + Programming- Python programming – Open source equivalent of existing
Commercial software

UNIT V    PROJECTS AND CASE STUDIES
Linux for portable Devices, Creation of Bootable CD and USB from command line, Case
Studies – Samba, Libreoffice, Assistive technology

TE XT BOOK:
edition, OReilly media, September 2009.

REFERENCES:
1. Philosophy of GNU URL: http://www.gnu.org/philosophy/
5. Version control system , URL: http://git-scm.com/
6. SVN version control , URL: http://svnbook.red-bean.com/
7. GTK+/GNOME Application
   Development, Havoc
   Pennington,
   URL: http://developer.gnome.org/doc/GGAD
   Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL:
   http://www.python.org/doc/current/tut/tut.html
8. Doug Abbot, Linux for Embedded and Embedded and Real time applications , Newnes
11. Case study, ORCA: http://live.gnome.org/Orca

PTIT8073    TCP/IP DESIGN AND IMPLEMENTATION
(Common to CSE & IT branches)

AIM:
At the end of this course the student will be able to
• Understand the internals of the TCP/IP protocols
• Understand how TCP/IP is actually implemented
• Understand the interaction among the protocols in a protocol stack

OBJECTIVES:
• To learn the basics of socket programming using TCP Sockets.
• To learn about Socket Options
• To learn to develop Macros for including Objects In MIB Structure
• To understand SNMPv1, v2 and v3 protocols & practical issues.
UNIT I  FUNDAMENTALS  9
Internetworking concepts - IP and datagram forwarding - TCP services - Interactive data flow - Timeout and retransmission - Bulk data flow - Persist timer – Keep-alive timer

UNIT II  ARP AND IP  9
Structure of TCP/IP in OS - Data structures for ARP - Cache design and management - IP software design and organization - Sending a datagram to IP

UNIT III  IP ROUTING IMPLEMENTATION  9
Routing table - Routing algorithms - Fragmentation and reassembly - Error processing (ICMP) - Multicast Processing (IGMP)

UNIT IV  TCP I/O PROCESSING AND FSM  9
Data structure and input processing - Transmission control blocks - Segment format - Comparison - Finite state machine implementation - Output processing - Mutual exclusion - Computing TCP data length

UNIT V  TCP TIMER AND FLOW CONTROL  9
Timers - Events and messages - Timer process - Deleting and inserting timer event - Flow control and adaptive retransmission - Congestion avoidance and control - Urgent data processing and push function

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE:

PTMA8001  ALGEBRA AND NUMBER THEORY  L T P C
3003

OBJECTIVES:
- To introduce the basic notions of groups, rings, fields which will then be used to solve related problems.
- To examine the key questions in the Theory of Numbers.
- To give an integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.

UNIT I  FIELDS  9
Group Theory - Rings and Polynomials – Fields.

UNIT II  FINITE FIELDS AND POLYNOMIALS  9
Finite Fields – Irreducible Polynomials over Finite fields – Factorization of Polynomials over Finite Fields.
UNIT III DIVISIBILITY THEORY AND CANONICAL DECOMPOSITIONS 9

UNIT IV DIOPHANTINE EQUATIONS AND CONGRUENCES 9
Linear Diophantine equations – Congruence’s – Linear Congruence’s - Applications: Divisibility tests – Modular Designs – Chinese remainder theorem – 2x2 linear systems.

UNIT V CLASSICAL THEOREMS AND MULTIPLICATIVE FUNCTIONS 9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTMA8251 NUMERICAL METHODS L T P C
(Common to IT, Printing ,Manufacturing, EEE, Industrial, Automobile) 3 0 0 3

OBJECTIVES:
- To provide the mathematical foundations of numerical techniques for solving linear system, Eigenvalue problems, interpolation, numerical differentiation and integration and the errors associated with them;
- To demonstrate the utility of numerical techniques of ordinary and partial differential equations in solving engineering problems where analytical solutions are not readily available.

UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9

UNIT II INTERPOLATION AND APPROXIMATION 9
Interpolation with unequal intervals - Lagrange interpolation – Newton’s divided difference interpolation – Cubic Splines - Interpolation with equal intervals - Newton’s forward and backward difference formulae – Least square method - Linear curve fitting.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 9
UNIT IV  INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS  

UNIT V  BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS  
Finite difference methods for solving two-point linear boundary value problems. Finite difference techniques for the solution of two dimensional Laplace’s and Poisson’s equations on rectangular domain – One dimensional heat-flow equation by explicit and implicit (Crank-Nicholson) methods - One dimensional wave equation by explicit method.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTMG8651  TOTAL QUALITY MANAGEMENT  L T P C
(Common to Manufacturing, Mechanical, Production, Printing, Industrial, Auto, Leather, CSE, ECE, IT & EEE)  3 0 0 3

AIM
To provide comprehensive knowledge about the principles, practices, tools and techniques of Total quality management.

OBJECTIVES:
- To understand the various principles, practices of TQM to achieve quality.
- To learn the various statistical approaches for Quality control.
- To understand the TQM tools for continuous process improvement.
- To learn the importance of ISO and Quality systems

UNIT I  INTRODUCTION  

UNIT II  TQM PRINCIPLES  
Quality statements - Customer focus –Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Continuous process improvement – PDCA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.
UNIT III  TQM TOOLS & TECHNIQUES I  
9  

UNIT IV  TQM TOOLS & TECHNIQUES II  
9  

UNIT V  QUALITY SYSTEMS  
9  

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES: