### ANNA UNIVERSITY, CHENNAI 600 025

**UNIVERSITY DEPARTMENTS**

**R 2013**

**B.E. (PART TIME) COMPUTER SCIENCE AND ENGINEERING**

**I TO VII SEMESTERS CURRICULUM AND SYLLABUS**

#### SEMESTER I

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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.

UNIT I MATRICES 9

UNIT II FUNCTIONS OF SEVERAL VARIABLES 9

UNIT III ANALYTIC FUNCTION 9
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 9
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 9

TOTAL: 45 PERIODS

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.

BOOKS FOR STUDY:
REFERENCES:

PTPH8153 PHYSICS FOR INFORMATION SCIENCE L T P C
(Common to Computer Science and Information Technology Branches) 3 0 0 3

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
OUTCOMES:
At the end of the course the students will be able to
- Understand the electrical, magnetic and optical properties of semiconductor materials
- Understand the concepts and applications of semiconductor devices

TEXT BOOKS:

REFERENCES:

PTCS8101 DIGITAL PRINCIPLES AND SYSTEM DESIGN L T P C
3 0 0 3

OBJECTIVES:
- To familiarize basic and advanced operations of boolean algebra
- To learn the designing of combinational and sequential circuits from Boolean functions
- To analyse the logic design using hardware description languages
- To know the application of logic design in advanced digital circuits like RAM and ROM

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES

UNIT II COMBINATIONAL LOGIC

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC

UNIT V MEMORY AND PROGRAMMABLE LOGIC

TOTAL: 45 PERIODS
OUTCOMES:
- To reduce simple Boolean functions using K-Maps
- To reduce complex Boolean functions using Tabulation method
- To transform logic circuits using universal logic gates
- To convert between digital codes using encoder/decoder
- To compile batch of digital operations using multiplexer/demultiplexer
- To design counting logic circuits using shift registers/digital counters
- To reduce state tables and state transition tables in asynchronous logic design
- To demonstrate error detection and error correction using digital circuits

TEXT BOOK:

REFERENCES:

PTGE8151 COMPUTING TECHNIQUES L T P C
3 0 0 3

OBJECTIVES:
The students should be made to:
- Learn the organization of a digital computer.
- Be exposed to the number systems.
- Learn to think logically and write pseudo code or draw flow charts for problems.
- Be exposed to the syntax of C.
- Be familiar with programming in C.
Learn to use arrays, strings, functions, pointers, structures and unions in C.

UNIT I INTRODUCTION 8

UNIT II C PROGRAMMING BASICS 10

UNIT III ARRAYS AND STRINGS 9
UNIT IV          FUNCTIONS AND POINTERS

UNIT V          STRUCTURES AND UNIONS
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

OUTCOMES:
At the end of the course, the student should be able to:
- Design C Programs for problems.
- Write and execute C programs for simple applications

TEXT BOOKS:

REFERENCES:

PTCS8102          PRINCIPLES OF COMPUTER ENGINEERING

OBJECTIVES:
- To know the evolution of computers
- To understand the basics of computer operations
- To differentiate between various streams of programming
- To understand the functions of operating systems
- To learn the basics of database management systems
- To learn the basics of computer networks

UNIT I          INTRODUCTION

UNIT II          SOFTWARE & HARDWARE
UNIT III OPERATING SYSTEMS

UNIT IV DATABASE MANAGEMENT

UNIT V NETWORKS

TOTAL: 45 PERIODS

OUTCOMES:
- To exercise the algorithmic /pseudocode approach to program design
- To appreciate the use of compiler and interpreter
- To identify the difference between the operations of MS-DOS, WINDOWS and UNIX
- To be able to write queries in database languages
- To explain the network topology within department / institute laboratories

TEXT BOOKS:

REFERENCE:

PTCS8201 COMPUTER ARCHITECTURE

OBJECTIVES:
- To learn the fundamentals of computer architecture
- To know the concepts behind parallelism and pipelining
- To learn advanced concepts in Instruction level parallelism
- To get introduced to binary arithmetic
- To learn about virtual memory, associative memory and memory management

UNIT I FUNDAMENTALS OF A COMPUTER SYSTEM
UNIT II BASIC PROCESSING UNIT

UNIT III ADVANCED CONCEPTS IN ILP AND CURRENT TRENDS

UNIT IV ARITHMETIC FOR COMPUTERS

UNIT V MEMORY AND I/O
Need for a hierarchical memory system – Types and characteristics of memories – Cache memories – Improving cache performance – Virtual memory – Memory management techniques – Associative memories.

Accessing I/O devices – Programmed Input/Output – Interrupts – Direct Memory Access – Interface circuits – Need for Standard I/O Interfaces like PCI, SCSI, USB.

OUTCOMES:
- To identify the functional units in a digital computer system
- To distinguish between the various ISA styles
- To trace the execution sequence of an instruction through the processor
- To compare different approaches used for implementing a functional unit
- To write programs involving interrupt handling

TEXT BOOK:

REFERENCES:
OBJECTIVES:
- To learn program independent view of data structures
- To know the data structure representation and various operations performed on them
- To learn algorithms for sorting, searching and indexing

UNIT I  LINEAR DATA STRUCTURES  11
Abstract Data Types - Asymptotic Notations: Big-Oh, Omega and Theta – Best, Worst and Average case Analysis: Definition and an example – Arrays and its representations – Stacks and Queues – Linked lists – Linked list based implementation of Stacks and Queues – Evaluation of Expressions – Linked list based polynomial addition.

UNIT II  NON-LINEAR DATA STRUCTURES  9

UNIT III  SEARCH STRUCTURES AND PRIORITY QUEUES  9
AVL Trees – Red-Black Trees – Splay Trees – Binary Heap – Leftist Heap

UNIT IV  SORTING  8

UNIT V  SEARCHING AND INDEXING  8
Linear Search – Binary Search - Hash tables – Overflow handling – Cylinder Surface Indexing – Hash Index – B-Tree Indexing.

TOTAL : 45 PERIODS

OUTCOMES:
- To analyse the programs and express their time complexity
- To write programs using linear and non-linear data structures
- To write programs for sorting, searching and indexing

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To develop programming skills from OO perspective
- To get introduced to handling pointer operations in combination with Object-orientation
- To learn to handle exceptions in OO operations
- To learn advanced file handling and stream operations

UNIT I
POINTERS AND FILE HANDLING IN C
9
Introduction to Pointers – Pointers and arrays – Pointers and structures – Pointers to functions – Applications of pointers – File Handling – Case study

UNIT II
INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING
9
Introduction – Procedure vs. object oriented programming – Data types – control structures – Arrays and Strings – User defined types – Functions and Pointers – Case study

UNIT III
OBJECT ORIENTED PROGRAMMING CONCEPTS
9
Classes and Objects – Operator Overloading – Inheritance – Polymorphism and Virtual Functions – Case study

UNIT IV
TEMPLATES AND EXCEPTION HANDLING
9
Function templates and class templates – Namespaces – Casting – Exception Handling – Case study.

UNIT V
FILES AND ADVANCED FEATURES
9

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs using pointers in combination with arrays, structures and functions
- To be able to convert a procedure-oriented program into object-oriented program
- To write OO programs using overloading
- To write programs that handle exceptions
- To write programs using dynamic memory allocation

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To learn the fundamentals and issues in database systems
- To appreciate the design of databases using relational models
- To learn data definition and query languages
- To understand the importanct of transaction management in databases
- To emphasize the need for sorting and indexing in databases
- To learn advanced representations of databases suited for real-time applications

UNIT I  INTRODUCTION TO DATABASE SYSTEMS  9
Data - Database Applications - Evolution of DB & DBMS - Need for data management – Data models & Database Architecture - Professions in DBMS - Key issues and challenges in Database Systems

UNIT II  ER & RELATIONAL MODELS  9
ER Diagrams - Relational Model - ER to Relational Mapping - Constraints - Keys - Dependencies - Relational Algebra - Normalisation - First, Second, Third BCNF - Fourth Normal Form – Fifth Normal Form.

UNIT III  DATA DEFINITION & QUERYING  8
Basic DDL - Introduction to SQL - Data Constraints - Triggers - Database Security – Advanced SQL - Embedded & Dynamic SQL - Views

UNIT IV  TRANSACTIONS & CONCURRENCY  10

UNIT V  ADVANCED TOPICS IN DATABASES  9

TOTAL : 45 PERIODS

OUTCOMES:
- To classify modern and futuristic database applications based on size and complexity
- To design a database from understanding an Universe of Discourse, using ER diagrams
- To be able to map ER model with Relational model
- To write queries using normalization criteria
- To create a physical database from a design using DDL
- To compare and contrast various indexing strategies in different database systems
- To critique how advanced databases differ from traditional databases.

TEXT BOOKS:
OBJECTIVES:
The student should be made to:
- Understand the use of Functions, Pointers and Files in C.
- Understand the Object Oriented Programming concepts of C++
- Analyze the use of advanced Object Oriented features in an application.

LIST OF EXPERIMENTS:
1. Programs using Functions and Pointers in C
2. Programs using Files in C
3. Programs using Classes and Objects
4. Programs using Operator Overloading
5. Programs using Inheritance, Polymorphism and its types
6. Programs using Arrays and Pointers
7. Programs using Dynamic memory allocation
8. Programs using Templates and Exceptions
9. Programs using Sequential and Random access files

TOTAL: 45 PERIODS

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
30 Terminals with C and C++ Compiler

OUTCOMES:
At the end of this course, the student will be able to:
- Write programs using Functions and Pointers in C.
- Design applications using Object Oriented Concepts
- Design Programs that use advanced concepts of C++
- Write Programs using Templates and Files using C++
- Critically analyze the use of C and C++ programming languages for different types of applications

OBJECTIVES:
- To comprehend the concepts of core java and working principles of Internet
- To learn client-server programming and web development
- To learn concepts related to web application development

UNIT I JAVA FUNDAMENTALS

UNIT II INTERNET BASICS AND JAVA NETWORK PROGRAMMING
UNIT III CLIENT-SIDE PROGRAMMING 9

UNIT IV SERVER-SIDE PROGRAMMING 9
Types of servers - Configuring and Using Web servers, Setting up Databases, Java Database Connectivity - Handling form data, validation, querying databases, information retrieval, response generation, Session management - using PHP, Servlets, JSP, ASP. NET.

UNIT V WEB APPLICATION DEVELOPMENT 9

TOTAL : 45 PERIODS

OUTCOMES:
- To write java programs using inheritance and exception handling
- To write programs using socket programming
- To write programs for client-side and server-side programming
- To create interactive web-sites and social web applications

TEXT BOOKS:

REFERENCES:
   http://www.w3schools.com/

PTCS8351 OPERATING SYSTEMS (Common to ECE,CSE,IT & EEE branches) 3 0 0 3

OBJECTIVES:
- To learn the components and operations of operating systems
- To get an idea about process synchronization
- To learn concepts behind inter-process communication
- To learn disk scheduling and process scheduling
- To understand 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

OUTCOMES:
- To write programs using multi-threading
- To solve problems related to process scheduling and disk scheduling
- To use synchronization concepts in real-time programs
- To apply banker’s algorithm for solving problems in deadlocks
- To solve problems related to paging and segmentation
- To implement OS concepts in Linux

TEXT BOOK:

REFERENCES:
OBJECTIVES:
- To provide an overview of software engineering
- To emphasize on following CMM
- To learn detailed concepts related to software engineering life cycle
- To understand the concepts of verification and validation
- To appreciate the necessity of assessing software quality and measurements

UNIT I SOFTWARE PROCESS MODELS

UNIT II REQUIREMENT ENGINEERING

UNIT III ANALYSIS MODELLING

UNIT IV DESIGN & TESTING

UNIT V QUALITY & MAINTENANCE

TOTAL: 45 PERIODS

OUTCOMES:
- To differentiate the perspective of various software process models
- To elicit the requirements for real-time problems
- To compile a SRS pertaining to industry standards
- To create a behavioral model from the set of requirements
- To develop a user-interface design for the given system
- To outline various software metrics and their context in measuring software programs
- To estimate the software cost
TEXT BOOKS:

REFERENCES:

PTGE8251 ENVIRONMENTAL SCIENCE AND ENGINEERING
L T P C
(ES30003)
(Common to Manufacturing, Mechanical, Printing, Production, Civil, CSE, IT, EEE, Industrial, chemical, & Textile)

OBJECTIVES:
To the study of nature and the facts about environment.
- To find and implement scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth’s interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14
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 8
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

OUTCOMES:
Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.

- Public awareness of environment at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions.
- Development and improvement in standard of living has lead to serious environmental disasters.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
The student should be made to:
- Understand Object Oriented features of Java.
- Learn about Socket programming and RMI in Java
- Understand Client side scripting and Server side programming
- Learn about Web application development in Java

LIST OF EXPERIMENTS:
1. Java classes and objects
2. Inheritance, Polymorphism
3. Interfaces and Exception Handling, Packages
4. Using InetAddress class
5. Socket Programming in Java
6. RMI
7. Client side scripting using
   XHTML, Javascript/DOM
   CSS
8. XML DTD, Parsers, XSLT
9. Programming with AJAX
10. Java Applets, AWT, Swings
11. Server Side programming (implement these modules using any of the server
    side scripting languages like PHP, Servlets, JSP, ASP.NET
    Gathering form data
    Querying the database
    Response generation
    Session management
12. MySQL/JDBC/Oracle
13. Application development
14. Develop applications using Dreamweaver/Flex/SilverLight etc.,

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:
- Implement programs using the Object Oriented features of Java
- Implement socket programming and Client side scripting in Java
- Design a Web application using Java Applets, AWT and Swings
- Develop application using Dreamweaver/Flex/Silver Light etc.
  including use of database connectivity

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS:
Software:
1. Browser
2. JDK version 6 update 27
3. TOMCAT 7.0
4. MySQL 5.5,
5. Oracle 11i
6. Dreamweaver CS5.5
7. NetBeans IDE 7
8. XAMPP / WAMP
OBJECTIVES:
- To understand the role of intelligent agents
- To learn uninformed and informed search strategies
- To understand the concepts behind constraint satisfaction
- To learn to represent knowledge effectively using propositional logic and predicate logic
- To learn various reasoning paradigms
- To understand the role of reasoning in machine learning

UNIT I INTRODUCTION

UNIT II PROBLEM SOLVING METHODS

UNIT III KNOWLEDGE REPRESENTATION

UNIT IV MACHINE LEARNING

UNIT V APPLICATIONS

OUTCOMES:
- To differentiate between various intelligent agents
- To solve problems involving informed and uninformed search strategies
- To represent natural language sentences using predicate logic and propositional logic
- To differentiate supervised learning from unsupervised learning
- To identify real world applications of AI

TEXT BOOKS:
REFERENCES:

PTCS8402  COMPUTER GRAPHICS AND MULTIMEDIA  L  T  P  C
  3 0 0 3

OBJECTIVES:
- To learn the fundamentals of graphics and multimedia
- To know the concepts of 2D and 3D graphics programming
- To acquire skills related to multimedia compression and animation
- To learn to handle multimedia objects

UNIT I  2D PRIMITIVES

UNIT II  2D GEOMETRIC TRANSFORMATIONS
2D Viewing – Window-Viewport Transformation - Two dimensional Geometric transformations – Line, Polygon, Curve and Text clipping algorithms

UNIT III  3D CONCEPTS
projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces - Visualization of data sets - 3D affine transformations – Viewing – Visible surface identification – Color Models, 3D Transformations in open GL

UNIT IV  MULTIMEDIA BASICS

UNIT V  MULTIMEDIA AUTHORING AND APPLICATIONS

TOTAL: 45 PERIODS

OUTCOMES:
- To develop, design and implement two and three dimensional graphical structures
- To differentiate lossy and lossless compressions
- To develop programming assignments related to animation
- To create interactive multimedia

TEXT BOOKS:
PTCS8403 DATA COMMUNICATION AND COMPUTER NETWORKS \hspace{1cm} L T P C
\hspace{1cm} 3 0 0 3

OBJECTIVES:
- To appreciate the top-down and bottom-up view of computer network architecture
- To know the functionality of each layer in computer networks
- To get introduced to various protocols at every layer
- To learn concepts related to network addressing
- To learn the use of hardware in data communication

UNIT I APPLICATION LAYER

UNIT II TRANSPORT LAYER

UNIT III NETWORK LAYER

UNIT IV DATA LINK LAYER

UNIT V DATA COMMUNICATIONS

OUTCOMES:
- To write programs for data communication in application layer
- To differentiate between the functional view of TCP and UDP
- To evaluate the protocols in network layer from QoS perspective
- To outline the protocols and topologies in data link layer
- To identify the use of various transmission media

TEXT BOOKS:
REFERENCES:

PTCS8451 OBJECT ORIENTED ANALYSIS AND DESIGN L T P C
(Common to CSE & IT branches) 3 0 0 3

OBJECTIVES:
- To understand the fundamentals of objects and their modeling
- To differentiate unified process from other approaches
- To emphasize on modeling based software design
- To familiarize with the modeling languages
- To reinforce software design with design patterns

UNIT I OOAD BASICS 10

UNIT II REQUIREMENTS & MORE MODELING 7

UNIT III DESIGN AND PRINCIPLES OF DESIGN 10

UNIT IV MAPPING TO CODE 8
Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint.

UNIT V MORE PATTERNS 10

TOTAL : 45 PERIODS

OUTCOMES:
- To express software design with UML diagrams
- To analyse the communication of software modules using interaction diagrams
- To identify and map basic software requirements in UML modeling
- To be capable of transforming UML based software design into pattern based design framework using design patterns
- To explain the purpose of applying particular design pattern to a specific module
- To outline and analyse the areas of design pattern correspondence with code
TEXT BOOKS:

REFERENCES:

PTCS8411 CASE TOOLS LABORATORY

OBJECTIVES:
The student should be made to:
- Learn the basics of OO analysis and design skills.
- Be exposed to the UML design diagrams.
- Learn to map design to code.
- Be familiar with the various testing techniques.

LIST OF EXPERIMENTS:
1. Study of case tools such as rational rose or equivalent tools
2. Requirements
   - Implementation of requirements engineering activities such as elicitation, validation, management using case tools.
3. Analysis and design
   - Implementation of analysis and design using case tools.
4. Study and usage of software project management tools such cost estimates and scheduling
5. Documentation generators - Study and practice of Documentation generators.
6. Data modeling using automated tools.
7. Practice reverse engineering and re engineering using tools.
8. Exposure towards test plan generators, test case generators, test coverage and software metrics.
9. Meta modeling and software life cycle management.

OUTCOMES:
At the end of the course, the student should be able to
- Design and implement projects using OO concepts.
- Use the UML analysis and design diagrams.
- Apply appropriate design patterns.
- Create code from design.
- Compare and contrast various testing techniques.

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
1. Case tools such as rational rose or equivalent tools. (30 user license).
2. Any Project management tools such as JxProject (freeware).
3. 1 server + 32 PCs (P4 or higher version with atleast 2 GB RAM).
OBJECTIVES:

- To study the details of lower layers of mobile architectures
- To learn to develop applications for various mobile OS
- To learn the concepts and protocols behind wireless networks

UNIT I  PERVERSIVE COMPUTING  9
Basics and vision – Architecture and Applications requirements – Smart devices and operating systems, secure services – Smart mobiles, cards and device networks.

UNIT II  MOBILE APPLICATIONS  9

UNIT III  MEDIUM ACCESS AND TELECOMMUNICATIONS  9

UNIT IV  WIRELESS NETWORKS  9

UNIT V  MOBILE NETWORK AND TRANSPORT LAYERS  9
Mobile IP – DHCP – Routings in Mobile ad hoc networks – TCP improvements – TCP over 2.5/3G.

TOTAL: 45 PERIODS

OUTCOMES:

- To explain the features of smart mobiles and other smart devices
- To develop applications for Android and iOS
- To explain protocols related to routing in mobile networks

TEXT BOOKS:

REFERENCES:

PTCS8502
SECURITY IN COMPUTING

OBJECTIVES:
- To understand the basics of cryptography
- To learn to find the vulnerabilities in programs
- To know the different kinds of security threats in networks, databases and their solutions
- To learn about models and standards of security

UNIT I ELEMENTARY CRYPTOGRAPHY

UNIT II PROGRAM SECURITY

UNIT III SECURITY IN NETWORKS

UNIT IV SECURITY IN DATABASES

UNIT V SECURITY MODELS AND STANDARDS

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs on public key encryption
- To differentiate malicious and non-malicious code
- To list and explain various type of threats in networks
- To write secured transactions in databases
- To explain various standards related to security models

TEXT BOOKS:

REFERENCES:

PTCS8511 MOBILE APPLICATION DEVELOPMENT LABORATORY

OBJECTIVES:
The student should be made to:
- Understand the basics of Mobile application development
- Be exposed to launching services in a mobile phone and launching Web Portal
- Familiar with application using android and iPhone SDK framework

LIST OF EXPERIMENTS:
1. General Form Design
2. Mobile browser based interactive applications
3. Applications using controls
4. Mobile networking applications (SMS/Email)
5. Applications involving data retrieval
6. Launching services in a mobile phone
7. Web portal development
8. Applications using Android SDK framework (like interactive applications, applications that make use of accelerometer sensor, video applications)
9. Applications that use the iPhone SDK framework
10. Testing the applications using emulators

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:
- Design Mobile Networking application using basic facilities
- Launch services on Mobile Phone that involves data retrieval
- Design and development a Web Portal
- Compare and Contrast Android SDK and iPhone Frame Works for different types of application and testing these applications using Emulators

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
1. JDK environment
2. J2ME
3. Sun Java Wireless Toolkit
4. Android SDK
5. iPhone SDK

28
OBJECTIVES:
- To evolve multidimensional intelligent model from a typical system
- To examine ways for representing multi dimensional data for a data warehouse
- To discover the knowledge imbibed in the high dimensional system
- To study algorithms for finding the hidden interesting patterns in data
- To study the performance of various mining techniques on complex data objects.

UNIT I  INTRODUCTION TO DATA WAREHOUSING  8
Evolution of Decision Support Systems- Data warehousing Components –Building a Data warehouse, Data Warehouse and DBMS, Data marts, Metadata, Multidimensional data model, OLAP vs OLTP, OLAP operations, Data cubes, Schemas for Multidimensional Database: Stars, Snowflakes and Fact constellations.

UNIT II  DATA WAREHOUSE PROCESS AND ARCHITECTURE  9
Types of OLAP servers, 3–Tier data warehouse architecture, distributed and virtual data warehouses.Data warehouse implementation , tuning and testing of data warehouse. Data Staging (ETL) Design and Development, data warehouse visualization, Data Warehouse Deployment, Maintenance, Growth, Business Intelligence Overview- Data Warehousing and Business Intelligence Trends - Business Applications - tools-SAS

UNIT III  INTRODUCTION TO DATA MINING  9
Data mining-KDD versus datamining, Stages of the Data Mining Process-task premitives, Data Mining Techniques -Data mining knowledge representation – Data mining query languages, Integration of a Data Mining System with a Data Warehouse – Issues, Data preprocessing – Data cleaning, Data transformation, Feature selection, Dimensionality reduction, Discretization and generating concept hierarchies-Mining frequent patterns- association-correlation

UNIT IV  CLASSIFICATION AND CLUSTERING  10
Decision Tree Induction - Bayesian Classification – Rule Based Classification –Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Clustering techniques – , Partitioning methods- k-means-Hierarchical Methods - distance-based agglomerative and divisive clustering, Density-Based Methods – expectation maximization -Grid Based Methods – Model-Based Clustering Methods – Constraint – Based Cluster Analysis – Outlier Analysis

UNIT V  APPLICATIONS  9
Mining complex data objects, Spatial databases, temporal databases, Multimedia databases, Time series and Sequence data; Text Mining –Graph mining-web mining-Application and trends in data mining

TOTAL: 45 PERIODS

OUTCOMES:
- To build a data warehouse for a real-world system
- To identify the necessity for database tuning in data warehouses
- To develop programs demonstrating dimensionality reduction
- To write programs for classification and clustering
- To develop applications related to web data mining
TEXT BOOKS:

REFERENCES:

PTCS8602 SERVICE ORIENTED ARCHITECTURE L T P C
3 0 0 3

OBJECTIVES:
- To gain understanding of the basic principles of service orientation, service oriented analysis techniques, technology underlying the service design
- To learn the advanced concepts such as service composition, orchestration and Choreography, and various WS-* specification standards

UNIT I FUNDAMENTALS OF SOA

UNIT II COMBINING SOA AND WEB SERVICES

UNIT III MULTI CHANNEL ACCESS AND WEB SERVICES COMPOSITION

UNIT IV JAVA WEB SERVICES
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)-Java API for XML based RPC (JAX-RPC)- Web Services Interoperability-SOA support in .NET – ASP.NET web services – Case Studies- Web Services Enhancements (WSE)

UNIT V WEB SERVICES SECURITY AND TRANSACTION

TOTAL: 45 PERIODS
OUTCOMES:
- To outline the concepts of SOA
- To develop a web service in Java
- To implement web security

TEXT BOOKS:

REFERENCES:

PTCS8611 SOFTWARE DEVELOPMENT LABORATORY L T P C 0 0 3 2

OBJECTIVES:
The student should be made to:
- Understand and apply software Engineering practices that are followed in Software Industries
- Develop a software package in any application.
Develop a software package in any application relevant to any area of study of your curriculum by applying the Software Engineering Practices generally done by software industries, which are
1. Identification of Use cases for each application system and SRS preparation.
2. Identification of reusable Components/Frameworks from open source and customizing them for each application.
3. Coding/Customizing/Wrapping for components/subsystems.
4. Testing – Scenario testing and test case preparation for each components/subsystems
5. Integration of subsystems and Testing
6. Simulation of datasets and load testing to analyze performance of the system.

TOTAL : 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:
- Develop a software package in any application by following the procedural steps namely Identification, Coding, Testing, Integration and Simulation.
OBJECTIVES

- To understand the current trend and basics of cloud computing.
- To differentiate between various service types: software, platform and infrastructure.
- To understand the collaboration of cloud services.
- To expose various ways to collaborate the cloud service online.
- To familiarize with technologies for cloud virtualization.
- To learn the standards behind cloud services.

UNIT I INTRODUCTION


UNIT II CLOUD SERVICES

Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service –Communication as services. Service providers- Google, Amazon, Microsoft Azure, IBM, Sales force.

UNIT III COLLABORATING USING CLOUD SERVICES


UNIT IV VIRTUALIZATION FOR CLOUD

Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization –System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V.

UNIT V SECURITY, STANDARDS AND APPLICATIONS


TOTAL: 45 PERIODS

OUTCOMES

- To be able to collaborate the cloud services to any device.
- To explore the online applications of cloud services.
- To implement cloud computing for the corporation.
- To design various applications by integrating the cloud services.

TEXT BOOKS:

REFERENCES:
2. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draft cloud computing synopsis and recommendation, May 2011.
UNIT V  CONTROLLING  9
System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control – Productivity problems and management – control and performance – direct and preventive control – reporting.

TOTAL: 45 PERIODS

OUTCOMES:
- Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management

TEXT BOOKS:

REFERENCES:

PTCS8001  .NET AND C# PROGRAMMING  L T P C
3 0 0 3

OBJECTIVES:
- To understand the concept of .NET framework
- To study the different techniques of security
- To get introduced to web services with ASP.NET
- To 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
OUTCOMES:
- To write programs using basic and advanced features of C#
- To write programs for threading and synchronization
- To develop web based applications on .NET
- To explain the concepts related to reflection

TEXT BOOK:

REFERENCE BOOKS:

PTCS8002 ADHOC AND SENSOR NETWORKS L T P C
3 0 0 3

OBJECTIVES:
- To study the protocols and the functionalities of ad hoc networks
- To understand the various applications developed based on ad hoc networking
- To know about the sensor networks
- To appreciate the challenges in establishing infrastructure for sensor networks and managing databases

UNIT I INTRODUCTION AND MAC PROTOCOLS 9

UNIT II ROUTING PROTOCOLS 9

UNIT III TRANSPORT LAYER AND SECURITY ISSUES 9

UNIT IV SENSOR NETWORKS AND NETWORKING SENSORS 9

UNIT V INFRASTRUCTURE ESTABLISHMENT AND NETWORK DATABASE 9

TOTAL: 45 PERIODS
OUTCOMES:
- To list the design issues in Ad-hoc networks
- To differentiate the working of various routing protocols
- To identify the challenges in sensor networks
- To outline issues related to synchronization and localization
- To evaluate the performance of protocols from QoS perspective

TEXT BOOKS:

REFERENCES:

PTCS8003 ADVANCED TOPICS ON DATABASES
OBJECTIVES:
- To know advanced concepts in databases in large scale analytics
- to learn concepts behind parallel, distributed, active, spatial, temporal and object databases
- to learn reasoning and query processing
- to understand the challenges in designing multimedia databases

UNIT I PARALLEL AND DISTRIBUTED DATABASES 9

UNIT II ACTIVE DATABASES 9

UNIT III TEMPORAL AND OBJECT DATABASES 9
UNIT IV  COMPLEX QUERIES AND REASONING  9
Logic of Query Languages – Relational Calculi – Recursive rules – Syntax and semantics of
Datalog – Fixpoint semantics – Implementation Rules and Recursion – Rule rewriting methods –
Compilation and Optimization – Recursive Queries in SQL – Open issues.

UNIT V  SPATIAL, TEXT AND MULTIMEDIA DATABASES  9
Traditional Indexing Methods (Secondary Keys, Spatial Access Methods) – Text Retrieval –
Uncertainties

OUTCOMES:
• to write programs involving query optimization
• to write programs related to large scale data processing
• to use MapReduce in data analytics
• to evaluate the performance of temporal and spatial databases
• to write suitable indexing programs for multimedia databases

TOTAL: 45 PERIODS

REFERENCES:
   Third Edition.
3. VLDB Journal.

FURTHER READING:
• http://video.google.com
• http://www.blinkvid.com/video
• http://www.crazyengineers.com/forum

PTCS8004  BIO INFORMATICS TECHNOLOGIES  L T P C
3 0 0 3

OBJECTIVES:
• To understand basic concepts of molecular biology and genetics
• To learn the concepts of computer science that relate to problems in biological sciences
• To learn to use computer as a tool for biomedical research
• To get introduced to important functional relationships from gene data.

UNIT I  INTRODUCTION  9
Need for Bioinformatics technologies – Overview of Bioinformatics technologies Structural
bioinformatics – Data format and processing – secondary resources and applications – Role of
Structural bioinformatics - Biological Data Integration System.

UNIT II  DATAWAREHOUSING AND DATAMINING IN BIOINFORMATICS  9
Bioinformatics data – Data warehousing architecture – data quality – Biomedical data analysis –
DNA data analysis – Protein data analysis – Machine learning – Neural network architecture and
applications in bioinformatics

UNIT III  MODELING FOR BIOINFORMATICS  9
Hidden markov modeling for biological data analysis – Sequence identification –Sequence
classification – multiple alignment generation – Comparative modeling – Protein modeling –
genomic modeling – Probabilistic modeling – Bayesian networks – Boolean networks - Molecular
modeling – Computer programs for molecular modeling.
UNIT IV  PATTERN MATCHING AND VISUALIZATION


UNIT V  MICROARRAY ANALYSIS


TOTAL: 45 PERIODS

OUTCOMES:

- To apply data warehousing and data mining concepts in bioinformatics
- To develop models for biological data
- To write programs using HMM for bioinformatics
- To write programs using pattern matching and visualization
- To apply microarray technology for genomic expression study

TEXT BOOKS:


REFERENCES:


PTCS8005  COMPUTATIONAL INTELLIGENCE

OBJECTIVES:

- To examine work at the frontiers of research in computing where ideas from biology are inspirations to build truly intelligent computer systems
- To analyse the dependencies among biology, complexity, computer science, informatics, cognitive science, robotics, and cybernetics
- To introduce concepts, models, algorithms, and tools for development of intelligent systems
- To create an understanding of the fundamental Computational Intelligence models
- To explore the theory and applications of two classes of system inspired by biology: neural networks and evolutionary computation
- To learn to apply Computational Intelligence techniques to classification, pattern recognition, prediction, rule extraction, and optimization problems.
UNIT I THEORETICAL FOUNDATIONS

UNIT II LEARNING

UNIT III EVOLUTIONARY COMPUTING
Neural Networks – Back propagation Networks – Hopfield Neural Networks – Radial Basis Function Networks – Learning Vector Quantisation - Artificial Neural Networks Fuzzy Classifiers – Fuzzy Cognitive Maps – Collective Intelligence - Swarm Intelligence – Ant routing – Adaptivity and self-organisation – quantitative emergence and control - Self-Organising Feature Maps

UNIT IV ARTIFICIAL IMMUNE SYSTEMS

UNIT V ADVANCED TOPICS

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs involving decision trees and clustering
- To write programs using machine learning
- To differentiate the operation of various type of neural networks
- To develop applications involving ACO and PSO

TEXT BOOKS:

REFERENCES:
PTCS8006 DATABASE TUNING

OBJECTIVES:
- To get the feel of basics of database tuning
- To learn concepts behind database design optimization
- To write procedures involving query planning

UNIT I SQL TUNING

UNIT II DESIGN OPTIMIZATION

UNIT III PERFORMANCE TUNING

UNIT IV TROUBLESHOOTING

UNIT V CASE STUDIES
Monitoring and Tuning Activities – Benchmarking results of Oracle SQL* Forms – Oracle 11g – Informix.

OUTCOMES:
- To design databases involving normalization
- To write optimized code for accessing multiple databases
- To use tuning tools for different database operations
- To troubleshoot databases
- To use benchmark databases for demonstrating concepts behind database tuning

TOTAL: 45 PERIODS

TEXT BOOKS:
OBJECTIVES:
- To learn the fundamentals of E-learning framework and lifecycle
- To know the potential uses of various learning management systems
- To familiarize the principles of E-learning
- To know the issues in designing interactive learning
- To appreciate the challenges and benefits of collaborative learning

UNIT I  INTRODUCTION

UNIT II  E-LEARNING STRATEGY

UNIT III  PRINCIPLES OF E-LEARNING
Philosophy of E-Learning – theory of learning – Applying principles of multimedia - Applying principles of contiguity - Applying principles of modality - Applying principles of redundancy - Applying principles of coherency - Applying principles of personalization- web-based learning communities - knowledge sharing and Knowledge management in e-learning- social networks and social media in e-learning

UNIT IV  DESIGN
On line E-Learning technologies – visual communication techniques- Computer-based technologies - Computer-mediated communication (CMC) - Assessment and evaluation- Organizing and designing learning sequences, Characteristics of Interactive Online Learning Media

UNIT V  IMPLEMENTATION
Leverages example in E-Learning – collaborative E-Learning- Learner control in E-Learning- guidelines to solve issues in E-Learning – Implementation of an E-Learning Course Content for a complete online course, Research in content retrieval and generation for E-Learning, Role of cloud and semantic Grid in E-Learning

TOTAL: 45 PERIODS

OUTCOMES:
- To analyze and compare different on-line E-Learning tools
- To design course content for a specific subject from different perspectives
- To plan and design the instruction and support level needs of learners of various backgrounds based on different learning methodologies
- To outline the various tasks of a typical online course facilitator
- To design and implement an E-Learning Course Content for a complete online course
TEXT BOOKS:

REFERENCES:
4. Topics (Wiley Series on Parallel and Distributed Computing)

PTCS8008 GRAPH THEORY AND COMBINATORICS L T P C 3 0 0 3

OBJECTIVES:
- To comprehend graphs as modeling and analysis tool
- To introduce various data structures with graph theory
- To learn fundamentals behind principle of counting and combinatorics

UNIT I INTRODUCTION 9

UNIT II TREES, CONNECTIVITY & PLANARITY 9

UNIT III MATRICES, COLOURING AND DIRECTED GRAPH 8

UNIT IV PERMUTATIONS & COMBINATIONS 9
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

OUTCOMES:
- To write programs involving basic graph algorithms
- To write programs for graph coloring
- To differentiate the potential use of directed and undirected graphs
- To outline the concepts of permutations and combinations

TEXT BOOKS:

REFERENCES:

PTCS8009 GREEN COMPUTING

OBJECTIVES:
- To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment
- To learn about energy saving practices
- To understand the impact of e-waste and carbon waste

UNIT I FUNDAMENTALS

UNIT II GREEN ASSETS AND MODELING

UNIT III GRID FRAMEWORK
UNIT IV GREEN COMPLIANCE

UNIT V CASE STUDIES
The Environmentally Responsible Business Strategies (ERBS) – Case Study Scenarios for Trial Runs – CASE STUDIES – Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector.

TOTAL: 45 PERIODS

OUTCOMES:
- To explain the necessity of GreenIT
- To outline methodologies for creating Green Assets and their management
- To appreciate the use of Grid in GreenIT
- To develop case studies related to Environmentally Responsible Business Strategies

TEXT BOOKS:

REFERENCES:

PTCS8010 HUMAN COMPUTER INTERACTION

OBJECTIVES:
- To determine the necessity and use of computers
- To learn the methodologies for designing interactive systems
- To discover various models used for designing HCI systems

UNIT I DESIGN PROCESS
UNIT II  DESIGN AND EVALUATION OF INTERACTIVE SYSTEMS  9

UNIT III  MODELS  9

UNIT IV  EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS OF HCI  9

UNIT V  THEORIES  9

OUTCOMES:
- To evaluate the use of interactive systems
- To map software engineering principles with HCI system design
- To outline the methodologies for statistical analysis of HCI
- To design effective HCI for individuals and persons with disabilities
- To develop meaningful user interface

TEXT BOOKS:

REFERENCE:

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PTCS8011  INFORMATION RETRIEVAL AND MANAGEMENT  L T P C
3 0 0 3

OBJECTIVES:
- To learn the concepts behind IR
- To understand the operation of web search engines
- To learn the algorithms related to classification and clustering in Text Mining
UNIT I  INTRODUCTION
Introduction - History of IR - Components of IR - Issues - Open source Search engine Frameworks, The impact of the web on IR - The role of artificial intelligence (AI) in IR – IR Versus Web Search - Components of a Search engine - Characterizing the web

UNIT II  INFORMATION RETRIEVAL
Boolean and vector-space retrieval models - Term weighting - TF-IDF weighting - cosine similarity - Preprocessing - Inverted indices - efficient processing with sparse vectors - Language Model based IR - Probabilistic IR - Latent Semantic Indexing - Relevance feedback and query expansion

UNIT III  WEB SEARCH ENGINE – INTRODUCTION AND CRAWLING
Web search overview, web structure, the user, paid placement, search engine optimization/spam. Web size measurement - search engine optimization/spam – Web Search Architectures - crawling - meta-crawlers - Focused Crawling - web indexes — Near-duplicate detection - Index Compression - XML retrieval

UNIT IV  WEB SEARCH – LINK ANALYSIS AND SPECIALIZED SEARCH
Link Analysis -- hubs and authorities - PageRank and HITS algorithms - Searching and Ranking – Relevance Scoring and ranking for Web – Similarity - Hadoop & MapReduce - Evaluation - Personalized search - Collaborative filtering and content-based recommendation of documents and products – handling "invisible" Web - Snippet generation, Summarization, Question Answering, Cross-Lingual Retrieval

UNIT V  DOCUMENT TEXT MINING
Information filtering; organization and relevance feedback – Text Mining - Text classification and clustering - Categorization algorithms: naive Bayes; decision trees; and nearest neighbor - Clustering algorithms: agglomerative clustering; k-means; expectation maximization (EM).

TOTAL: 45 PERIODS

OUTCOMES:
- To use an open source search engine framework and explore its capabilities
- To represent documents in different ways and discuss its effect on similarity calculations and on search
- To modify Page Rank and HITS
- To design and implement an innovative feature in a search engine
- To explain the search components affected by the innovation, design a smart information management system with Information Retrieval components

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To provide a sound knowledge in various middleware technologies
- To familiarize between various web service architectures and their standards

UNIT I  INTRODUCTION

UNIT II  EJB and CORBA
EJB architecture - Overview of EJB software architecture, EJB Conversation, Building and Deploying EJBs, Roles, applications - EJB Session Beans, EJB entity beans - Lifecycle of Beans - EJB clients - developing an application - Deployment. CORBA – components - architectural features - method invocations - static and dynamic: IDL - CORBA’s self-describing data - interface repository - Building an application using CORBA - Overview of CORBA Services - Object location Services, Messaging Services - CORBA Component Model.

UNIT III  COM and .NET
Evolution of DCOM - Introduction to COM - COM clients and servers - COM IDL - COM Interfaces COM Threading Models – Marshalling - Custom and standard marshalling - Comparison COM and CORBA - Introduction to .NET - Overview of .NET architecture - Remoting.

UNIT IV  SOA and WEB SERVICES

UNIT V  OTHER TYPES OF MIDDLEWARE
Other types of Middleware, Real-Time Middleware, Embedded Systems Middleware, Mobile Middleware, Oracle Fusion Middleware

OUTCOMES:
- To implement programs in EJB
- To map and differentiate the functions between COM and .NET
- To outline the functionalities of various types of middleware technologies
- To design web services

TEXT BOOKS:
REFERENCES:

PTCS8013 NANO COMPUTING L T P C 3 0 0 3

OBJECTIVES:
- To understand the basics of nano computing
- To appreciate the necessity of quantum computing
- To familiarize with quantum computing softwares

UNIT I NANO Computing-Prospects and Challenges 9

UNIT II Nanocomputing with Imperfections 9
Introduction - Nanocomputing in the Presence of Defects and Faults - Defect Tolerance - Towards Quadrillion Transistor Logic Systems

UNIT III Reliability of Nanocomputing 9
Markov Random Fields - Reliability Evaluation Strategies - NANOLAB - NANOPRISM - Reliable Manufacturing and Behavior from Law of Large Numbers

UNIT IV Nanoscale Quantum Computing 9
Quantum Computers - Hardware Challenges to Large Quantum Computers - Fabrication, Test, and Architectural Challenges - Quantum-dot Cellular Automata (QCA) - Computing with QCA - QCA Clocking - QCA Design Rules

UNIT V QCadesigner Software and QCA Implementation 9
Basic QCA Circuits using QCADesigner - QCA Implementation - Molecular and Optical Computing: Molecular Computing - Optimal Computing - Ultrafast Pulse Shaping and Tb/sec Data Speeds

TOTAL: 45 PERIODS

OUTCOMES:
- To list the challenges and issues in nano-computing research
- To identify the challenges in quantum computing
- To develop programs for QCA

TEXT BOOK:
REFERENCES:

PTCS8014       NATURAL LANGUAGE PROCESSING       L T P C
                               3 0 0 3
OBJECTIVES:
• To learn the fundamentals of natural language processing
• To appreciate the use of CFG and PCFG in NLP
• To understand the role of semantic analysis

UNIT I         INTRODUCTION

UNIT II        MORPHOLOGY AND PART OF SPEECH TAGGING

UNIT III       SYNTAX PARSING
Syntax Parsing - Grammar formalisms and treebanks - Parsing with Context Free Grammars - Features and Unification -Statistical parsing and probabilistic CFGs (PCFGs)-Lexicalized PCFGs.

UNIT IV        SEMANTIC ANALYSIS

UNIT V         APPLICATIONS
Named entity recognition and relation extraction- IE using sequence labeling-Machine Translation (MT) - Basic issues in MT-Statistical translation-word alignment- phrase-based translation – Question Answering

OUTCOMES:
• To tag a given text with basic Language processing features
• To design an innovative application using NLP components
• To implement a rule based system to tackle morphology/syntax of a language
• To design a tag set to be used for statistical processing for real-time applications
• To compare and contrast use of different statistical approaches for different types of NLP applications.

TOTAL: 45 PERIODS
TEXT BOOKS:
2. Foundations of Statistical Natural Language Processing by Christopher D. Manning and Hinrich Schuetze, MIT Press, 1999
3. Steven Bird, Ewan Klein and Edward Loper Natural Language Processing with Python, O'Reilly Media; 1 edition, 2009

REFERENCES:
3. NLTK – Natural Language Tool Kit - http://www.nltk.org/

PTCS8015 NETWORK ANALYSIS AND MANAGEMENT L T P C
3 0 0 3

OBJECTIVES:
- To learn the network analysis and flow analysis with a network tool
- To understand the evaluation methodologies for Network analysis and Management

UNIT I INTRODUCTION

UNIT II ARCHITECTURE

UNIT III NETWORK MANAGEMENT

UNIT IV NETWORK MANAGEMENT ORGANIZATION

UNIT V MANAGEMENT INTEGRATION

OUTCOMES:
- To use a network analysis tool to analyse a given network
- To use NMS for network management operations

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

PTCS8016 PRINCIPLES OF CRYPTOGRAPHY AND NETWORK SECURITY  L  T  P  C
                                                           3  0  0  3

OBJECTIVES:
- To appreciate the use of cryptography and digital signatures
- To learn the standards of encryption
- To learn various encryption algorithms
- To kno the importance of network security
- To learn various types of network attacks

UNIT I CLASSICAL CRYPTOSYSTEM

UNIT II BLOCK CIPHER

UNIT III MESSAGE AUTHENTICATION

UNIT IV NETWORK SECURITY

UNIT V WIRELESS NETWORK SECURITY

TOTAL: 45 PERIODS

OUTCOMES:
- To demonstrate the fundamentals of encryption using popular algorithms
- To compile security protocols and practices for wired and wireless networks
- To design a firewall

TEXT BOOKS:
REFERENCES:

PTCS8017 PRINCIPLES OF DISTRIBUTED SYSTEMS

OBJECTIVES:
- To explain the goals and types of distributed systems
- To describe operation of distributed OS
- To emphasize the benefits of using distributed transactions
- To learn issues related to developing fault-tolerant systems

UNIT I INTRODUCTION
Introduction to Distributed systems - challenges - architectural models - fundamental models - P2P systems - Introduction to interprocess communications - external data representation and marshalling- client server communication - group communication-multicast/pubsub - Energy Efficient Computing - Cloud computing

UNIT II DISTRIBUTED OBJECTS AND FILE SYSTEM
Introduction - Communication between distributed objects - Remote procedure call - Events and notifications - Java RMI case Study - Introduction to DFS - File service architecture – Google file system - Introduction to Name Services- Name services and DNS - Directory and directory services-ClusterComputing-mapreduce/bigtable.

UNIT III DISTRIBUTED OPERATING SYSTEM SUPPORT
The operating system layer – Protection - Process and threads - Communication and invocation - Operating system architecture - Introduction to time and global states - Clocks, Events and Process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Distributed mutual exclusion - Overlay Networks – DHT

UNIT IV TRANSACTION AND CONCURRENCY CONTROL-DISTRIBUTED TRANSACTIONS
Transactions – Nested transaction – Locks - Optimistic concurrency control - Timestamp ordering - Comparison of methods for concurrency control - Introduction to distributed transactions - Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery - Data- Intensive Computing and Map Reduce

UNIT V FAULT TOLERANCE, SECURITY AND REPLICA
Case study: Multiplayer online games, Social networking services, Large object CDN’s (video/audio streaming systems)

TOTAL: 45 PERIODS
OUTCOMES:

- To implement distributed systems in the areas of system processes, communication applications, naming and synchronization
- To design distributed systems that take into account consistency, replication and/or fault tolerance
- To evaluate the security of distributed systems.

TEXT BOOKS:


REFERENCES:

3. Haggit Attiya, “Distributed Computing: Fundamentals, Simulations, and Advanced E-

PTCS8018 PRINCIPLES OF EMBEDDED AND REAL TIME SYSTEMS

OBJECTIVES:

- To obtain a broad understanding of the technologies and applications of embedded and real-time systems
- To understand the architecture of embedded systems and real-time systems
- To have a basic knowledge on the various issues involved in real-time databases
- To know how embedded systems can be made more fault tolerant
- To learn about embedded/real-time operating systems and the various issues associated with them

UNIT I INTRODUCTION TO EMBEDDED SYSTEM ARCHITECTURE


UNIT II REAL-TIME SYSTEM AND TASKS


UNIT III REAL-TIME DATABASES AND COMMUNICATION

UNIT IV  FAULT-TOLERANCE TECHNIQUES  9

UNIT V  EMBEDDED/REAL-TIME OPERATING SYSTEMS  9

OUTCOMES:
• To outline the ideas of real-time task scheduling
• To explain techniques of fault-tolerance
• To analyse the operations of real-time OS

TEXT BOOKS:

REFERENCES:

PTCS8019  SOFTWARE QUALITY AND TESTING  L T P C
3 0 0 3

OBJECTIVES:
• To understand the basics of software quality
• To learn various metrics of software quality
• To introduce concepts behind designing of test cases
• To learn the procedure of debugging a given software

UNIT I  INTRODUCTION TO SOFTWARE QUALITY  8
UNIT II SOFTWARE QUALITY METRICS AND RELIABILITY


UNIT III TEST CASE DESIGN


UNIT IV TEST MANAGEMENT


UNIT V CONTROLLING AND MONITORING


TOTAL: 45 PERIODS

OUTCOMES:

- To analyse software documentations using inspections and walkthrough
- To associate various software metrics to context
- To list the components of test plan
- To explain the principles behind SCM

TEXT BOOKS:


REFERENCES:


PTCS8020 SYSTEM MODELING AND SIMULATION L T P C

OBJECTIVES:

- To understand the concepts using natural models of computation
- To learn various mathematical models
- To learn to analyse simulation data
- To get introduced to various simulation tools
UNIT I   INTRODUCTION TO SIMULATION  
Introduction – Simulation Terminologies- Application areas – Model Classification Types of Simulation- Steps in a Simulation study- Concepts in Discrete Event Simulation Example.

UNIT II  MATHEMATICAL MODELS  

UNIT III  ANALYSIS OF SIMULATION DATA  

UNIT IV  VERIFICATION AND VALIDATION  
Building – Verification of Simulation Models – Calibration and Validation of Models – Validation of Model Assumptions – Validating Input – Output Transformations.

UNIT V   SIMULATION OF COMPUTER SYSTEMS AND CASE STUDIES  
Simulation Tools – Model Input – High level computer system simulation – CPU – Memory Simulation – Comparison of systems via simulation – Simulation Programming techniques - Development of Simulation models.

TOTAL: 45 PERIODS

OUTCOMES:
- To apply statistical models for simulation
- To compare various systems for simulation

TEXT BOOKS:

REFERENCES:

PTCS8071  CYBER FORENSICS  
(Common to CSE & IT branches)  L T P C  3 0 0 3

OBJECTIVES:
- To understand Computer Forensics, Computing Investigations, Enforcement Agency Investigations, Corporate Investigations, forensically sound principles and practices related to digital evidence collection, management, and handling.
UNIT I TYPES OF COMPUTER FORENSICS

UNIT II DATA RECOVERY

UNIT III ELECTRONIC EVIDENCE

UNIT IV THREATS

UNIT V SURVEILLANCE

TOTAL: 45 PERIODS

OUTCOMES:
- To demonstrate data recovery from hardware
- To list various software threats
- To identify and explain the working of surveillance tools

TEXT BOOK:

REFERENCES:

PTCS8072 GAME PROGRAMMING L T P C (Common to CSE & IT branches) 3 0 0 3

OBJECTIVES:
- To get subsequent understanding of game design and development
- To learn the processes, mechanics, issues in game design
- To get exposed to the architecture of game programming
- To know about game engine development, modeling, techniques and frameworks
- To learn about 3D graphics principles and animation techniques

UNIT I 3D GRAPHICS FOR GAME PROGRAMMING
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

OUTCOMES:
- To create interactive games

TEXT BOOKS:

REFERENCES:
6. Andy Harris, “Beginning Flash Game Programming For Dummies”, For Dummies; Updated edition, 2005.
OBJECTIVES:
- To understand the semantic web architecture
- To learn about ontological engineering
- To learn web ontology language
- To discover the capabilities and limitations of semantic web technology for different applications

UNIT I INTRODUCTION

UNIT II ONTOLOGICAL ENGINEERING

UNIT III STRUCTURING AND DESCRIBING WEB RESOURCES

UNIT IV WEB ONTOLOGY LANGUAGE

UNIT V SEMANTIC WEB TOOLS AND APPLICATIONS

OUTCOMES:
- To build and implement a small ontology that is semantically descriptive of the chosen problem domain
- To implement applications that can access, use and manipulate the ontology
- To represent data from a chosen problem in XML with appropriate semantic tags obtained or derived from the ontology
- To depict the semantic relationships among the data elements using Resource Description Framework (RDF)
- To design and implement a web services application that “discovers” the data and/or other web services via the semantic web

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

PTCS8074 SOFTWARE AGENTS L T P C
3 0 0 3

OBJECTIVES:
- To understand how software agents reduce information overhead
- To gain knowledge in use of software agents for cooperative learning and personal assistance
- To know how agent can communicate and share knowledge using agent communication language
- To gain knowledge in design of an agent interpreter and intelligent agent
- To understand the concept of mobile technology and mobile agents and its security

UNIT I AGENT AND USER EXPERIENCE 9
Agent characteristics- object Vs agent. Agent types- Interacting with Agents - Agent From Direct Manipulation to Delegation - Interface Agent, Metaphor with Character – Designing Agents – problem solving agent, rational agent. Direct Manipulation versus Agent Path to Predictable

UNIT II AGENTS FOR LEARNING AND ASSISTANCE 9

UNIT III AGENT COMMUNICATION AND COLLABORATION 9
Overview of Agent Oriented Programming - Agent Communication Language – KQML-Per formatives. Agent Based Framework of Interoperability. Virtual agents: agents in games and virtual environments; companion and coaching agents; modeling personality, emotions; multimodal interaction; verbal and non-verbal expressiveness.
UNIT IV  AGENT ARCHITECTURE

UNIT V  MOBILE AGENTS

OUTCOME:
To develop a software agent for real-time application

TEXT BOOK:

REFERENCES:

PTCS8075  UNIX INTERNALS
(Common to CSE & IT branches)  L T P C  3 0 0 3

OBJECTIVES:
- To provide knowledge about Unix operating system working principles, its file system and programming for interprocess communication
- To learn shell programming and filters
- To get an understanding on 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 9

UNIT IV PROCESSES 9

UNIT V MEMORY MANAGEMENT AND I/O 9

TOTAL: 45 PERIODS

OUTCOMES:
- To write UNIX programs using file system calls
- To write UNIX programs for process scheduling and page replacement
To write UNIX programs on inter-process communication

TEXT BOOK:

REFERENCES:

PTGE8551 ENGINEERING ETHICS AND HUMAN VALUES L T P C
(Common to CSE, ECE, EEE, Industrial, Textile, Printing, Auto, Mechanical & Civil branches) 3 0 0 3

OBJECTIVE:
The course explains various moral issues through predominant theories. It educates the code of ethics as well as the industry standards and how they can be used for ensuring safety and reducing the risk. The course enunciated the Rights and Responsibilities of individuals. Various other ethical global issues also have been explained along with case studies.

UNIT I HUMAN VALUES 10
UNIT II ENGINEERING ETHICS

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION
Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law – The Challenger Case Study

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS

UNIT V GLOBAL ISSUES

OUTCOMES:
- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

TEXT BOOK:

REFERENCES:

WEB SOURCES:
1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org
OBJECTIVES:
The student should be made to:
- Understand the techniques for processing images including the different File formats used
- Be exposed different image enhancement techniques
- Learn about image segmentation and feature analysis
- Understand the role of multi resolution analysis in image processing
- Study various applications of image processing

UNIT I  FUNDAMENTALS OF IMAGE PROCESSING
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
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
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

UNIT V  APPLICATIONS OF IMAGE PROCESSING

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:
- Explain the various steps in image processing
- Compare and Contrast different image enhancement techniques
- Critically analyze various image segmentation and feature analysis
- Apply Multi resolution analysis to image processing
- Design various applications using image processing

TEXT BOOKS:
REFERENCE BOOKS:

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

OBJECTIVES:
The student should be made to:
- Be exposed to the context and operation of free and open source software (FOSS) communities and associated software projects.
- Be familiar with participating in a FOSS project
- Learn scripting language like Python
- Learn some important FOSS tools

UNIT I PHILOSOPHY
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 – userfriendliness perspective – scientific perspective

UNIT II SYSTEM ADMINISTRATION
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
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

OUTCOMES:
Upon completion of the course, the student should be able to:
- Install and run open-source operating systems.
- Gather information about Free and Open Source Software projects from software releases and from sites on the internet.
- Build and modify one or more Free and Open Source Software packages.
- Use a version control system.
- Contribute software to and interact with Free and Open Source Software development projects.
TEXT BOOK:

REFERENCE BOOKS:
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
8. Application
9. Development,
10. Havoc
11. Pennington.
12. URL:
14. Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL:
16. Doug Abbot, Linux for Embedded and Embedded and Real time applications , Newnes
17. Case study SAMBA: URL : http://www.samba.org/

PTIT8073 TCP/IP DESIGN AND IMPLEMENTATION L T P C
(Common to CSE & IT branches) 3 0 0 3

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
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
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
Routing table - Routing algorithms - Fragmentation and reassembly - Error processing (ICMP) - Multicast Processing (IGMP)

UNIT IV TCP I/O PROCESSING AND FSM
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

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

OUTCOMES:

At the end of this course the student should 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

TEXT BOOKS:


REFERENCE:


TOTAL : 45 PERIODS
UNIT IV TQM TOOLS & TECHNIQUES II

UNIT V QUALITY SYSTEMS

TOTAL : 45 PERIODS

OUTCOMES :
- The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

TEXT BOOK:

REFERENCES:

PTCS8075 FOUNDATION SKILLS IN INTEGRATED PRODUCT DEVELOPMENT

OBJECTIVE:
This program can be offered with all Undergraduate programs/courses for all engineering streams. The FSIPD program aims to improve student’s awareness and understanding of the basic concepts involved in Integrated product Development (IPD) by providing exposure to the key product development concepts. Students, who complete this program, will stand a better chance to be considered for jobs in the Engineering industry.

OBJECTIVES:
After completing this program, the student will be able to obtain the technical skills needed to effectively play the entry level design engineer role in an engineering organization.

The student will be able to:
- Understand the global trends and development methodologies of various types of products and services
- Conceptualize, prototype and develop product management plan for a new product based on the type of the new product and development methodology integrating
the hardware, software, controls, electronics and mechanical systems

- Understand requirement engineering and know how to collect, analyze and arrive at requirements for new product development and convert them in to design specification
- Understand system modeling for system, sub-system and their interfaces and arrive at the optimum system specification and characteristics
- Gain knowledge of the Innovation & Product Development process in the Business Context

UNIT I  FUNDAMENTALS OF PRODUCT DEVELOPMENT

Global Trends Analysis and Product decision - Social Trends - Technical Trends-
Economical Trends - Environmental Trends - Political/Policy Trends - Introduction to
Product Development Methodologies and Management - Overview of Products and
Services - Types of Product Development - Overview of Product Development
methodologies - Product Life Cycle - Product Development Planning and Management

UNIT II  REQUIREMENTS AND SYSTEM DESIGN

Requirement Engineering - Types of Requirements - Requirement Engineering - Traceability
Matrix and Analysis - Requirement Management - System Design & Modeling -
Introduction to System Modeling - System Optimization - System Specification - Sub-System
Design - Interface Design

UNIT III  DESIGN AND TESTING

Conceptualization - Industrial Design and User Interface Design - Introduction to Concept
generation Techniques – Challenges in Integration of Engineering Disciplines - Concept
Screening & Evaluation - Detailed Design - Component Design and Verification –
Mechanical, Electronics and Software Subsystems - High Level Design/Low Level Design of
S/W Program - Types of Prototypes, S/W Testing- Hardware Schematic, Component design,
Layout and Hardware Testing – Prototyping - Introduction to Rapid Prototyping and Rapid
Manufacturing - System Integration, Testing, Certification and Documentation

UNIT IV  SUSTENANCE ENGINEERING AND END-OF-LIFE

(EOL)SUPPORT

Introduction to Product verification processes and stages - Introduction to Product validation
processes and stages - Product Testing standards and Certification - Product Documentation -
Sustenance - Maintenance and Repair – Enhancements - Product EoL - Obsolescence
Management - Configuration Management - EoL Disposal

UNIT V  BUSINESS DYNAMICS ENGINEERING SERVICES INDUSTRY

The Industry - Engineering Services Industry - Product development in Industry versus
Academia - The IPD Essentials - Introduction to vertical specific product development
processes - Manufacturing/Purchase and Assembly of Systems - Integration of Mechanical,
Embedded and S/W systems – Product development Trade-offs - Intellectual Property Rights
and Confidentiality - Security and configuration management.

TOTAL: 45 PERIODS

OUTCOMES:
The students will be able to

- Define, formulate and analyze a problem
- Solve specific problems independently or as part of a team
- Develop documentation, test specifications and coordinate with various teams to
validate and sustain up to the EoL (End of Life) support activities for engineering
customer
- Work independently as well as in teams
- Manage a project from start to finish
COURSE MATERIAL AND PEDAGOGY:

- NASSCOM has agreed to prepare / revise the course materials [selected teachers Anna University from major disciplines will be included in the process] as PPT slides for all the UNITS. The PPTs can be printed and given to each student if necessary at a Nominal Fee. This is the best possible material for this special course.
- NASSCOM will train the teachers of Anna University to enable them to teach this course. A training programme for nearly 3500 teachers needs to be organized. The team is exploring use of technology including the EDUSAT facility at Anna University.
- The course is to be offered as an elective to all UG Students both in the Constituent Colleges and Affiliated colleges of Anna University.

TEXT BOOKS [INDIAN ECONOMY EDITIONS]:

REFERENCES:

PTGE8071                           DISASTER MANAGEMENT     L T P C
                                          3 0 0 3

OBJECTIVES:
- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

UNIT I INTRODUCTION TO DISASTERS  9
Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT II APPROACHES TO DISASTER RISK REDUCTION (DRR)  9
Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stake-
UNIT III  INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV  DISASTER RISK MANAGEMENT IN INDIA

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V  DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

OUTCOMES:
The students will be able to
- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation.
- Draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disaster damage assessment and management

TEXT BOOK:

REFERENCES
1. Govt. of India: Disaster Management Act , Government of India, New Delhi, 2005
OBJECTIVES:
- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I

UNIT II

UNIT III
Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV
Human Rights in India – Constitutional Provisions / Guarantees.

UNIT V

TOTAL : 45 PERIODS

OUTCOMES:
- Engineering students will acquire the basic knowledge of human rights.

REFERENCES: