## 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.

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:
REFERENCES:

PTPH8153 PHYSICS FOR INFORMATION SCIENCE
(Common to Computer Science and Information Technology Branches)

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

UNIT II SEMICONDUCTORS AND TRANSPORT PHYSICS

UNIT III MAGNETIC PROPERTIES OF MATERIALS

UNIT IV OPTICAL PROPERTIES OF MATERIALS
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

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

PTCS8101 DIGITAL PRINCIPLES AND SYSTEM DESIGN

OBJECTIVE
Learn how to design digital circuits, both Combinational and Sequential. Also, to learn to design using PLDs, and writing codes for designing larger digital systems using HDLS.

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

TEXT BOOK:

REFERENCES:
UNIT I  INTRODUCTION  8

UNIT II  C PROGRAMMING BASICS  10
Problem formulation - Problem Solving - Introduction to 'C' programming - fundamentals - structure of a 'C' program - compilation and linking processes - Constants, Variables - Data Types - Expressions using operators in 'C' - Managing Input and Output operations - Decision Making and Branching - Looping statements - solving simple scientific and statistical problems.

UNIT III  ARRAYS AND STRINGS  9
Arrays - Initialization - Declaration - One dimensional and Two dimensional arrays. String - String operations - String Arrays. Simple programs- sorting- searching - matrix operations.

UNIT IV  FUNCTIONS AND POINTERS  9
Function - definition of function - Declaration of function - Pass by value - Pass by reference - Recursion - Pointers - Definition - Initialization - Pointers arithmetic - Pointers and arrays - Example Problems.

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:
UNIT II SOFTWARE & HARDWARE

UNIT III OPERATING SYSTEMS

UNIT IV DATABASE MANAGEMENT

UNIT V NETWORKS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE:

PTCS8201 COMPUTER ARCHITECTURE L T P C
3 0 0 3

OBJECTIVE
Identify the functional units in a digital computer system, distinguish between the various ISA styles, trace the execution sequence of an instruction through the processor, compare different approaches used for implementing a functional unit and evaluate different computer systems based on performance metrics.

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.

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

PTCS8202  DATA STRUCTURES  L T P C
3 0 0 3

OBJECTIVE:
Learning program independent view of data structures, including its representation and operations performed on them, which are then linked to sorting, searching and indexing methods to increase the knowledge of usage of data structures in algorithmic perspective.

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

TEXT BOOKS:

REFERENCES:

PTCS8203  PROGRAMMING USING C++  L T P C
3 0 0 3

OBJECTIVE
To develop the programming skill and to solve engineering related problems using Object Oriented Programming Concepts.

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
TEXT BOOKS:

REFERENCES:

PTCS8204 DATABASE MANAGEMENT SYSTEMS L T P C
(Common to CSE & IT programmes) 3 0 0 3

OBJECTIVE
Classify modern and futuristic database applications based on size and complexity; design a database from understanding an Universe of Discourse, using ER diagrams; map ER model into Relations and to normalize the relations; create a physical database from a design using DDL statements with appropriate key, domain and referential integrity constraints; analyze different ways of writing a query and justify which is the effective and efficient way; and compare and contrast various indexing strategies in different database systems and list key challenges in advanced database systems and to critique how they differ from traditional database systems.

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
TEXT BOOKS:

PTCS8211 PROGRAMMING LABORATORY L T P C
0 0 3 2

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

PTCS8301 JAVA AND INTERNET PROGRAMMING L T P C
3 0 0 3

OBJECTIVE
This course comprehends the concepts of core java and working principles of Internet, and the knowledge will be enhanced to the client and server side programming and web development.

UNIT I JAVA FUNDAMENTALS 9

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

UNIT IV  SERVER-SIDE PROGRAMMING
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

TOTAL : 45 PERIODS

TEXT BOOKS:

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

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

OBJECTIVE
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:

PTCS8352 SOFTWARE ENGINEERING
(Common to CSE & IT branches)

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:
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

TEXT BOOKS:

REFERENCE BOOKS:

PTCS8311  JAVA AND INTERNET PROGRAMMING LABORATORY

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.,

**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

**TOTAL: 45 PERIODS**

**PTCS8401 ARTIFICIAL INTELLIGENCE**

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**OBJECTIVE**

To search and discover intelligent characteristics of existing AI projects, map a new problem – as search and create an animation – showing different search strategies for a problem, program a new game/ problem in Prolog, evaluate different Knowledge Representation schemes for typical AI problems, design and implement a typical AI problem to be solved Using Machine Learning Techniques, design and implement a futuristic AI application

**UNIT I INTRODUCTION**


**UNIT II PROBLEM SOLVING METHODS**


**UNIT III KNOWLEDGE REPRESENTATION**

UNIT IV  MACHINE LEARNING  9

UNIT V  APPLICATIONS  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT III 3D CONCEPTS 9
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 9

UNIT V MULTIMEDIA AUTHORING AND APPLICATIONS 9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:

PTCS8403 DATA COMMUNICATION AND COMPUTER NETWORKS L T P C
3 0 0 3

OBJECTIVE
Gets the idea of choosing the required functionality at each layer for a given application and trace the flow of information from one node to another node in the network. Then gives the understanding of division of network functionalities in to layers, the component required to build different types of networks and identifying the solution for the functionalities in each layer.

UNIT I APPLICATION LAYER 9

UNIT II TRANSPORT LAYER 9
UNIT III  NETWORK LAYER  9

UNIT IV  DATA LINK LAYER  9

UNIT V  DATA COMMUNICATIONS  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

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  10

UNIT II  REQUIREMENTS & MORE MODELING  7
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  

TEXT BOOKS:

REFERENCES:

PTCS8411  CASE TOOLS LABORATORY  
L T P C  0 0 3 2

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.

TOTAL : 45 PERIODS

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).
OBJECTIVE:
To study the details of lower layers of mobile architectures in the context of pervasive computing and mobile applications.

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

TEXT BOOKS:

REFERENCES:
OBJECTIVE
To understand the basics of cryptography, learn to find the vulnerabilities in programs and to overcome them, know the different kinds of security threats in networks, databases and the different solutions available, and learn about the models and standards for 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

TEXT BOOKS:

REFERENCES:

TOTAL: 45 PERIODS
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

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

OBJECTIVE
This course deals with evolving multidimensional intelligent model from a typical system, representation of multi dimensional data for a data warehouse, discovering the knowledge imbibed in the high dimensional system, finding the hidden interesting patterns in data, and gives the idea to evaluate various mining techniques on complex data objects.

UNIT I
INTRODUCTION TO DATA WAREHOUSING
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
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 divisible 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

TEXT BOOKS:

REFERENCES:

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

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

UNIT I  FUNDAMENTALS OF SOA  9
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

TEXT BOOKS:

REFERENCES:

PTCS8611 SOFTWARE DEVELOPMENT LABORATORY

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
## OBJECTIVE
This course gives the idea of evolution of cloud computing and its services available today, which may led to the design and development of simple cloud service. It also focused on some key challenges and issues around cloud computing.

### 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**

### TEXT BOOKS:

### REFERENCES:
2. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draft cloud computing synopsis and recommendation, May 2011.
OBJECTIVES:
To learn the different principles and techniques of management in planning, organizing, directing and controlling.

- To study the Evolution of Management
- To study the functions and principles of management
- To learn the application of the principles in an organization

UNIT I  INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS

UNIT II  PLANNING

UNIT III  ORGANISING

UNIT IV  DIRECTING

UNIT V  CONTROLLING
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

TEXT BOOKS:

REFERENCES:
PTCS8001 .NET AND C# PROGRAMMING

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
C# and the .NET framework - C# basics - Objects and types - Inheritance - Arrays - Operators and casts – Indexes

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

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

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

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

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCE BOOKS:

PTCS8002 ADHOC AND SENSOR NETWORKS

OBJECTIVE
To study the protocols and the functionalities of ad hoc networks, understanding the various applications developed based on ad hoc networking, addressing issues and challenges created. To know about the sensor networks and addressing the challenges in establishing infrastructure for sensor networks and managing database.

UNIT I INTRODUCTION AND MAC PROTOCOLS
UNIT II ROUTING PROTOCOLS

UNIT III TRANSPORT LAYER AND SECURITY ISSUES

UNIT IV SENSOR NETWORKS AND NETWORKING SENSORS

UNIT V INFRASTRUCTURE ESTABLISHMENT AND NETWORK DATABASE

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTCS8003 ADVANCED TOPICS ON DATABASES L T P C 3 0 0 3
OBJECTIVE
To know advanced concepts of database in large scale analytics, derive data maintenance, change schema, database update and Benchmark Object Databases, deals with uncertainties in advanced concepts of database, and open issues in database technologies.

UNIT I PARALLEL AND DISTRIBUTED DATABASES
UNIT II  ACTIVE DATABASES  9

UNIT III  TEMPORAL AND OBJECT DATABASES  9

UNIT IV  COMPLEX QUERIES AND REASONING  9

UNIT V  SPATIAL, TEXT AND MULTIMEDIA DATABASES  9

TOTAL: 45 PERIODS

REFERENCES:
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

OBJECTIVE:
To understand basic concepts of molecular biology and genetics, the concepts of computer science that relate to problems in biological sciences, computer as a tool for biomedical research, and 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

UNIT IV  PATTERN MATCHING AND VISUALIZATION

UNIT V  MICROARRAY ANALYSIS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTCS8005  COMPUTATIONAL INTELLIGENCE

OBJECTIVE
To examine work at the frontiers of research in computing where ideas from biology are inspirations to build truly intelligent computer systems; analyse the dependencies among biology, complexity, computer science, informatics, cognitive science, robotics, and cybernetics.; introduce concepts, models, algorithms, and tools for development of intelligent systems; create an understanding of the fundamental Computational Intelligence models; explore the theory and applications of two classes of system inspired by biology: neural networks and evolutionary computation; and 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

TEXT BOOKS:

REFERENCES:

PTCS8006 DATABASE TUNING
OBJECTIVE
To use Tuning tools for different operations; optimization to different mechanism of Database; and change Schema, Database update and Benchmark Databases.
UNIT I SQL TUNING 9
Recovery subsystem – Operating system consideration – Hardware Tuning.

UNIT II DESIGN OPTIMIZATION 9
Techniques – Tuning Relational Systems – Normalization – Tuning Denormalization –
Clustering two tables – Aggregate Maintenance – Record Layout – Query Tuning – Triggers –
Client server mechanism – Bulk Loading data – Accessing Multiple Databases.

UNIT III PERFORMANCE TUNING 9
Approach – Performance Tuning Vs Relational database Applications – Performance Monitoring

UNIT IV TROUBLESHOOTING 9
Query plan explainers – Performance Monitors – Event Monitors – Finding Suspicious Queries

UNIT V CASE STUDIES 9
Monitoring and Tuning Activities – Benchmarking results of Oracle SQL* Forms – Oracle 11g –
Informix.

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Dennis Shasha and Philippe Bonnet “Database Tuning, Principles, Experiments, and
2. Peter Gulutzan & Trudy Pelzer, “SQL Performance Tuning”, Addison-Wesley, 1st edition,
2002.

PTCS8007 E-LEARNING TECHNIQUES

OBJECTIVE
To analyze and compare different on-line E-Learning tools, design course content for a specific
subject from different perspective, plan and design the instruction and support needs of learners
of various backgrounds, levels and situations based on different learning methodologies, outline
the various tasks of a typical online course facilitator, and Design and Implement an E-Learning
Course Content for a complete online course

UNIT I INTRODUCTION 9
E-Learning - E-Learning cycle - E-Learning types - challenges and opportunities – cognitive
presence –Approaches to design E-Learning - E-Learning framework - 6C framework - E-
Learning Tools

UNIT II E-LEARNING STRATEGY 9
Role of tutor - E-Learning strategy - Blended E-Learning – M-Learning- problem based learning-
Enterprise learning- Corporate Learning- Web based Learning - Pod casting -Learning
Management systems – Content development process – E-Learning standards- SCORM
standard- managing e-learning quality - case studies

36
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

TEXT BOOKS:

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

PTCS8008 GRAPH THEORY AND COMBINATORICS

OBJECTIVES:
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  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  10
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:

PTCS8009  GREEN COMPUTING  L T P C
3  0  0  3

OBJECTIVE
To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment, skill in energy saving practices in their use of hardware, examine technology tools that can reduce paper waste and carbon footprint by user, and to understand how to minimize equipment disposal requirements.
UNIT I  FUNDAMENTALS  9

UNIT II  GREEN ASSETS AND MODELING  9

UNIT III  GRID FRAMEWORK  9

UNIT IV  GREEN COMPLIANCE  9

UNIT V  CASE STUDIES  9
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

TEXT BOOKS:

REFERENCES:

PTCS8010  HUMAN COMPUTER INTERACTION  L T P C
3 0 0 3

OBJECTIVE
Determine the need for computers and evaluate the use of computers, identify the stages in software engineering that need to be modified for effectiveness of interacting with computers, discover the various models that can be used for designing systems, evaluate the design techniques by applying the apt statistical approach, and design dialogue for representation to computers
UNIT I  DESIGN PROCESS 9

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

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE:
OBJECTIVE

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

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

TEXT BOOKS:
REFERENCES:

PTCS8012 MIDDLEWARE TECHNOLOGIES  L T P C
3 0 0 3

OBJECTIVE
This course provides a sound knowledge in various middleware technologies for distributed applications. Also, it gives familiarization 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

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

PTCS8013 NANO COMPUTING L T P C
3 0 0 3

OBJECTIVE
This course is intended to provide the students with the prospects, challenges, imperfections, reliability and with insight into Nanoscale Quantum Computing and QCA implementation.

UNIT I  NANOCOMPUTING-PROSPECTS AND CHALLENGES

UNIT II  NANOCOMPUTING WITH IMPERFECTIONS
Introduction - Nanocomputing in the Presence of Defects and Faults - Defect Tolerance - Towards Quadrillion Transistor Logic Systems

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

UNIT IV  NANOSCALE QUANTUM COMPUTING
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
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

TEXT BOOK:

REFERENCES:
OBJECTIVE
To tag a given text with basic Language processing features, design an innovative application using NLP components, implement a rule based system to tackle morphology/syntax of a Language, design a tag set to be used for statistical processing keeping an application in mind, design a Statistical technique for a new application, Compare and contrast use of different statistical approaches for different types of applications.

UNIT I  INTRODUCTION  9

UNIT II  MORPHOLOGY AND PART OF SPEECH TAGGING  9

UNIT III  SYNTAX PARSING  9
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  9

UNIT V  APPLICATIONS  9
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

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/
OBJECTIVE
To learn the network analysis and flow analysis with a network tool and to evaluate the performance of the design issues and architecture to meet the network communication requirements, and to understand how network management technology works to manage today’s system.

UNIT I  INTRODUCTION  9

UNIT II  ARCHITECTURE  9

UNIT III  NETWORK MANAGEMENT  9

UNIT IV  NETWORK MANAGEMENT ORGANIZATION  9

UNIT V  MANAGEMENT INTEGRATION  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I CLASSICAL CRYPTOSYSTEM 9

UNIT II BLOCK CIPHER 9

UNIT III MESSAGE AUTHENTICATION 9

UNIT IV NETWORK SECURITY 9

UNIT V WIRELESS NETWORK SECURITY 9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

PTCS8017 PRINCIPLES OF DISTRIBUTED SYSTEMS L T P C
3 0 0 3

OBJECTIVE:
• Explain the goals and types of distributed systems, describe and implement distributed systems in the areas of system processes, communication applications, naming and synchronization, design distributed systems that take into account consistency, replication and/or fault tolerance, and to evaluate the security of distributed systems.

UNIT I INTRODUCTION 9
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 REPLICATION
Overview of security techniques - Cryptographic algorithms – Digital signatures - Cryptography
pragmatics – Distributed Replication - CDNs and replication – Fault tolerant services - Byzantine
Fault Tolerance - Detecting and Correcting Local Faults - Logging and Crash Recovery – Highly
available services – Transactions with replicated data.
Case study: Multiplayer online games, Social networking services, Large object CDN’s
(video/audio streaming systems)

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Tanenbaum, A. and van Steen, M., Distributed Systems: Principles and Paradigms, 2nd ed,

REFERENCES:
1. Mukesh Singhal, Ohio State University, Columbus, “Advanced Concepts In Operating
2. Kenneth P. Birman, “Reliable Distributed Systems: Technologies, Web Services, and
Applications”, Springer
3. Haggit Attiya, “Distributed Computing: Fundamentals, Simulations, and Advanced E-
OBJECTIVE:
To obtain a broad understanding of the technologies and applications of embedded and real-time systems; understand the architecture of embedded systems and real-time systems; have a basic knowledge on the various issues involved in real-time databases; know how these systems can be made more fault tolerant; and learn about embedded/real-time operating systems and the various issues associated with them.

UNIT I INTRODUCTION TO EMBEDDED SYSTEM ARCHITECTURE 9

UNIT II REAL-TIME SYSTEM AND TASKS 9

UNIT III REAL-TIME DATABASES AND COMMUNICATION 9

UNIT IV FAULT-TOLERANCE TECHNIQUES 9

UNIT V EMBEDDED/REAL-TIME OPERATING SYSTEMS 9

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

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

OBJECTIVE
Gives an understanding of basics of Software Quality. Functional testing, Control Flow based testing, Data Flow based and Mutation testing, Software Reliability, and formal verification of programs.

UNIT I  INTRODUCTION TO SOFTWARE QUALITY  8

UNIT II  SOFTWARE QUALITY METRICS AND RELIABILITY  9

UNIT III  TEST CASE DESIGN  11

UNIT IV  TEST MANAGEMENT  9

UNIT V  CONTROLLING AND MONITORING  8

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

PTCS8020 SYSTEM MODELING AND SIMULATION

OBJECTIVE
To understand the system, specify systems using natural models of computation, modeling techniques, prediction of behavior, and decision support.

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

TEXT BOOKS:

REFERENCES:

PTCS8071  CYBER FORENSICS
(Common to CSE & IT branches)
3 0 0 3

OBJECTIVE
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
Computer Forensics Fundamentals – Types of Computer Forensics Technology – Types of
Vendor and Computer Forensics Services.

UNIT II     DATA RECOVERY
Data Recovery – Evidence Collection and Data Seizure – Duplication and Preservation of
Digital Evidence – Computer Image Verification and Authentication.

UNIT III    ELECTRONIC EVIDENCE
Networks.

UNIT IV     THREATS
Fighting against Macro Threats – Information Warfare Arsenal – Tactics of the Military – Tactics
of Terrorist and Rogues – Tactics of Private Companies.

UNIT V      SURVEILLANCE

TOTAL: 45 PERIODS
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
REFERENCES:
6. Andy Harris, “Beginning Flash Game Programming For Dummies”, For Dummies; Updated edition, 2005.

PTCS8073 SEMANTIC WEB L T P C
(Common to CSE & IT branches) 3 0 0 3

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

UNIT I INTRODUCTION

UNIT II ONTOLOGICAL ENGINEERING
Ontologies – Taxonomies – Topic Maps – Classifying Ontologies - Terminological aspects: concepts, terms, relations between them – Complex Objects -Subclasses and Sub-properties definitions –Upper Ontologies – Quality – Uses - Types of terminological resources for ontology building – Methods and methodologies for building ontologies – Multilingual Ontologies - Ontology Development process and Life cycle – Methods for Ontology Learning – Ontology Evolution – Versioning

UNIT III STRUCTURING AND DESCRIBING WEB RESOURCES

53
UNIT IV WEB ONTOLOGY LANGUAGE


UNIT V SEMANTIC WEB TOOLS AND APPLICATIONS


TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

 PTCS8074 SOFTWARE AGENTS

OBJECTIVE
Understand the how software agents reduce information overhead, 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, gain knowledge in design of an agent interpreter and intelligent agent, and understand the concept of mobile technology and mobile agents and its security.

UNIT I AGENT AND USER EXPERIENCE
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

UNIT III AGENT COMMUNICATION AND COLLABORATION
Overview of Agent Oriented Programming - Agent Communication Language – KQML-Performatives. 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

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

PTCS8075 UNIX INTERNALS
(Common to CSE & IT branches)

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

PTGE8551 ENGINEERING ETHICS AND HUMAN VALUES
(/common to CSE, ECE, EEE, Industrial, Textile, Printing, Auto, Mechanical & Civil branches)

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

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

TEXTBOOK:

REFERENCES:

WEB SOURCES:
1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org
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

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:
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
– userfriendliness 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 10
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 9
Linux for portable Devices, Creation of Bootable CD and USB from command line, Case Studies
– Samba, Libreoffice, Assistive technology

TEXT BOOK:
edition, OReilly media, September 2009.

REFERENCE BOOKS:
1. Philosophy of GNU URL: http://www.gnu.org/philosophy/
4. Linux: Rute’s User tutorial and exposition, URL: http://rute.2038bug.com/index.html.gz
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/
18. Case study, Libre office: http://www.libreoffice.org/
PTIT8073  TCP/IP DESIGN AND IMPLEMENTATION  L T P C
(Common to CSE & IT branches)  3 0 0 3

OBJECTIVES:
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
- 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:
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

UNIT IV  
TQM TOOLS & TECHNIQUES II

UNIT V  
QUALITY SYSTEMS

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES: