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**TITLE OF ELECTIVE COURSES**

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Opting for Electives:

ADVANCED JAVA THEORY AND ADVANCED JAVA LAB should be chosen together.

ADVANCED .NET THEORY AND ADVANCED .NET LAB should be chosen together.

NEURAL NETWORKS USING MATLAB THEORY AND NEURAL NETWORKS LAB should be chosen together.

NETWORK SECURITY THEORY AND NETWORK SECURITY LAB should be chosen together.

# 3 HOURS will be taken by MCA department and 3 HOURS will be taken by Visual Communication department per week

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<td>QUANTITATIVE Aptitude</td>
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*Two hours will be taken in regular class hours and 2 hours will be taken outside the class hours.

**Summer Training Program:** During summer vacation of second year each student should undergo training in a software or software related industry for 30 working days and they have to present their learning soon after the college is reopened. 2 credits will be awarded for the successful completion.

**Term Paper:** Each student has to present paper in any subject related topic during fifth semester. Paper presented in other institutions also will be considered equivalent. Marks will be given after evaluation and it will be added to third component of software development.
Objectives:

To provide mathematical foundation for computer science courses that include data structures, database theory, compiler theory, computer architecture and operating systems.

Unit I Mathematical logic

Unit II Set theory and Mathematical induction

Unit III Combinatorics

Unit IV Graph theory

Unit V Group theory and Finite automata
Group Theory: Algebraic Structures - Semigroups and Monoids – Homomorphism - Isomorphism and cyclic groups - Cosets and Lagrange’s Theorem - Elements of Coding Theory. Modeling Computation: Languages and Grammars - Finite-State Machines with output, with No output, Language Recognition.
Book for Study:

Book for Reference:

NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”

Discrete Structures by Prof.Kamala Kirthivasan, IIT Madras
Objectives

This course introduces the basic programming knowledge in C++ using OOPs concepts and data structures for computing related applications.

UNIT I Introduction

s/w evolution—features of procedure oriented programming—basic concepts of OOPs—benefits of OOPs—applications of OOPs—tokens—expressions—data types—variables—storage class specifiers—constants—operators—control structures—arrays—pointers.

UNIT I OOPS

Class and objects—functions—friend function—inline function—**constructors**: types—overloading constructor—destructors—**Inheritance**: types—**Polymorphism**: function overloading—operator overloading (unary and binary)—virtual functions—console I/O—files—exception handling.

UNIT III Linear data structure

Definition—**stack**: operation—**applications**: infix to postfix and prefix conversion—evaluation of postfix expression—tower of Hanoi—**Queue**: operations—types—applications—**List**: single linked list—double linked list—circular linked list. **Sorting**: bubble sort—insertion sort—selection sort—quick sort—radix sort—merge sort. **Searching**: linear search—binary search.

UNIT IV Trees
Basic terminologies—**binary trees**: representation—traversal—reconstruction—binary search trees—forest—conversion of binary trees into forest—threaded binary trees—B Trees—AVL trees—Red Black trees—Heap tree—Hashing—Hash functions.

**UNIT-V Graphs**

Basic terminologies—representation—types—traversal—**minimum spanning tree**: Kruskul’s algorithm—Prim’s algorithm—**shortest path**: Dijkstra’s algorithm

**Book for Study: C++**


**Book for Reference: C++**


**Books for Study: Data Structures**


NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”

**Data Structures and Algorithms by Prof. Naveen Garg, IIT Delhi.**

**Introduction to Problem Solving and Programming by D. Gupta, IIT Kanpur.**
Objectives:

1. To create awareness about Free and Open Source Software
2. To acquire proficiency in Web Programming

Unit I History of FOSS
The FOSS Revolution - History of Free/Open Source and BSD Software - FOSS Licences (GPL, CC, ..) Living with Free Software - Discussion FOSS Projects

Unit II PHP basics

Unit III Functions & security
Built-in Functions – User-defined Functions - Regular Expression – Validating Data Entry – Form Handling – Cookies – Session Tracking

Unit IV MySQL
MySQL: Getting Started with MySQL – Basic Data Types – Database and Table Creation – Performing Operations on Table Data – Running Calculations on Table Data – Grouping the Data – Functions in MySQL – Database Access with PHP and MySQL. Eclipse, an Integrated Development Environment.

Unit V CSS

Book for Study

Book for Reference
Objectives
To understand better the structure and logic behind the working of various functional modules of a computer and the interaction between them.

Unit I Basics of Logic Design


Unit II Digital Components


Unit III Basic Computer Organisation and Design


Unit IV Architecture


Unit V Memory

Memory Hierarchy – Main Memory - Paging and Segmentation – Auxiliary Memory – Cache – Virtual Memory – Memory Management Hardware – Multiprocessor Interconnection Structures.

Books for Study
Books for Reference


NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”

Computer Organization by Prof. S. Raman, IIT Madras
Computer Architecture by Prof. Anshul Kumar, IIT Delhi.
Objectives:
To learn the concept of Database Management Systems

Unit-I Structured Query Language

Unit-II Database Design

Unit-III Application design and development

Unit-IV Indexing & Hashing

Unit-V Managing concurrency backup and recovery
Transaction :Transaction Concept- State - Implementation of atomicity and durability - Concurrent execution - recoverability - Concurrency Control -Lock-based - Timestamp-based - validation based Protocols - Multiple granularity - Multiversion schemes - Deadlock Handling -

**Book for Study**


**Books for Reference**

NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”

Database Design by Prof. S. Srinath and Prof. D. Janaki Ram, IIT Madras.
LAB EXERCISES

C++:

1. Control statements
   a. Branching statements
   b. Looping statements
2. Arrays
   a. Matrix manipulation
   b. Polynomial addition
3. Functions
   a. Categories of function
4. Pointers
   a. Pointers to arrays
   b. Pointers to functions
   c. Pointers to objects
5. Class and Objects
6. Array of objects
7. Friend functions
8. Inline functions
9. Constructor and Destructor
10. Types of constructor
11. Constructor Overloading
12. Inheritance types
13. Polymorphism
   a. Function Overloading
   b. Operator overloading(unary and binary)
   c. Virtual functions
14. I/O formatting
15. Files
Data Structures:
1. Stack Operations (checking the boundary conditions)
2. Stack applications
   a. Infix to Postfix expression
   b. Evaluation of Expression
3. Queue Operations (checking the boundary conditions)
4. Circular Queue
5. Single Linked List (creation, insertion, deletion, searching)
6. Doubly Linked List (creation, insertion, deletion, searching)
7. Linked Stack
8. Linked Queue
9. Sorting
   a. Bubble sort
   b. Selection sort
   c. Insertion sort
   d. Radix sort
   e. Merge sort
10. Searching
    a. Linear search
    b. Binary search
11. Tree Traversals
12. Graph Traversals

Shortest Path – Dijkstra’s Algorithm
CA 1810 DATABASE MANAGEMENT SYSTEMS LAB
Semester : I  Credits: 2
Category: MC  No of Hours/week: 4

Lab Exercises

1. Execute a single line and group functions for a table.

2. Execute DCL and TCL Commands.

3. Create and manipulate various DB objects for a table.

4. Create views, partitions and locks for a particular DB.

5. Write PL/SQL procedure for an application using exception handling.

6. Write PL/SQL procedure for an application using cursors.

7. Write a DBMS program to prepare reports for an application using functions.

8. Write a PL/SQL block for transaction operations of a typical application using triggers.

9. Write a PL/SQL block for transaction operations of a typical application using package.

10. Design and develop an application using any front end and back end tool (make use of ER diagram and DFD).

Typical Applications - Banking, Electricity Billing, Library Operation, Pay roll, Insurance, Inventory, etc. using PHP as front end
SEMESTER II

CA 2803 STATISTICAL METHODS FOR COMPUTER APPLICATIONS
Semester : II Credits: 3
Category: MC No of Hours/week: 4

Objectives:

1. To give foundation in statistical aspect of computer science
2. To train students in SPSS statistical software package.

Unit I Basic Statistics

Unit II Probability

Unit III Distribution Functions
Binomial Distribution – Poisson Distribution – Normal Distribution – Uniform Distribution

Unit IV Concept of Sampling :
Methods of sampling - Concepts of sampling distributions and standard error - Interval estimation of Mean and proportion. Test of Hypothesis - Critical region - Two
types of errors - Level of significance - Large sample tests for mean and proportion - Exact tests based on normal, $t$, $F$ and Chi-square distributions.

Unit VANova, Time series & SPSS


Books for Study

Books for Reference
Objectives:

1. To introduce the basics of Java Programming
2. To prepare them to learn advanced Java Programming

Unit I Introduction to Java

Unit II String classes

Unit III Java Threading

Unit IV Applet

Unit V Working with Awt classes and networking basics

Books for Study
Book for Reference

Objectives
To train the students to develop software in the object oriented methodology
To introduce the software project management concepts.

Unit I Software Engineering Concepts

Unit II Modeling with UML

Unit III Construction

Unit IV Testing

Unit V Managing object-oriented software engineering

Book for Study

**Book for Reference**

NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”

Software Engineering by Prof. Rushikesh K. Joshi & Others, IIT Mumbai.
System Analysis and Design by Prof. V. Rajaram, IISc Bangalore.
Objectives

This course introduces the basic concepts of Microprocessor, interfacing and its applications.

UNIT I: Introduction

Microcomputer: Overview of structure and operation. Microprocessor: evolution and types—8086 internal architecture. —Introduction to programming: language types — addressing modes—program development steps—constructing m/code—program development tools—standard program structure.

UNIT II: Instructions

String — procedures — Macros—Instruction descriptive—assembler directives.

UNIT III: Bus signals and Interrupts


UNIT IV: Interfacing and Memory

Parallel ports—Handshaking—Interfacing: digital and analog devices—Microcomputer based processor control system.—Memory: DMA—DRAM.

UNIT V: Advanced Microprocessors


Books for Study:


\textbf{e-Book for Reference}


\textbf{NPTEL Video Lectures from Loyola College Intranet under “NPTELVideoPortal”}

\textit{Microprocessors and Microcontrollers by Prof. Krishna Kumar, IISc., Bangalore}
Objectives:

1. To impart hands-on training on the fundamental OS Concepts by being centric on UNIX

2. To enable students to acquire theoretical knowledge along with the know-how to implement the concepts programmatically

3. To expose students to the various gamut of UNIX Programming such as Shell Scripts, Stand-alone and Network Programming

Unit I


Unit II


Unit III

Unit – IV


Unit V


Books for Study


Books for Reference


NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”
Operating Systems by Prof. P.C.P. Bhatt, IISc., Bangalore
LAB EXERCISES

1. Programs implementing Inheritance, method overriding

2. Programs implementing Access specification among the package.

3. Programs implementing Inter Thread communication.

4. Programs implementing Calendar, random, vector classes.

5. Programs implementing the event handling both mouse and Keyboard.

6. Programs implementing AWT menus, font, images, images.

7. Programs implementing JBDC to a applet window to get and displaying Student details.

Programs using socket programming
LAB EXERCISES

1. Program to demonstrate the UNIX basic Commands.

2. Program using basic Network commands.

3. Program to demonstrate the Programming Constructs for Shell Scripts.

4. Construction of a Shell Script that validates whether the entered name corresponds to a file name or directory name.

5. Program to demonstrate the Access Permissions.


7. Program to deploy Inter Process Communication using Pipes.

8. Program to deploy Inter Process Communication using FIFOs.


10. Program to perform Inter Process Communication using shared Memory.

11. Program to perform synchronization using Semaphores.

12. Program to demonstrate Shortest Job First CPU Scheduling.

13. Program to demonstrate Round-Robin Scheduling.

14. Program using TCP sockets (Client and Server).

15. Program using UDP sockets (Client and Server). And Program for FTP.
SEMESTER III

CA3805 .NET TECHNOLOGIES

Semester :III
Category: MC

Credits: 4
No of Hours/week: 4

Objectives

1. To introduce the students to .NET Framework and Visual Studio IDE for Application Development and Deployment
2. To impart skills for developing desktop and windows applications using VB.NET
3. To train the students on deploying ADO.NET connectivity for windows and web applications

Unit I Introduction to .NET Technologies
Introduction to Internet and Web Technologies-HTML Basics - Scripts- Client-side Vs Server-side Scripts - Sample Programs – Advantages and Disadvantages of Client-side and Server-side Scripts - Client-side Technologies Overview - Server-side Technologies Overview History of the Platform of .NET - .NET Framework Components Overview with Focus on CLR, CTS.

Unit II VB.NET Building Blocks

Unit III Application Development in VB.NET
Windows Forms – Working with Controls – Timer, Picture-box, Group-box, Combo-box, Horizontal and Vertical Scrollbar, Numeric-up-down, Track-bar, and Progress-bar – Menus Dialog-boxes – Pop-Menus - Developing MDI – Multithreaded Programming – Code Modularization – Subroutines and Functions VB.NET Built-in Functions – Mathematical Functions, Strings, Date and Time, Data Type Inspection, Data Type Conversion, Financial and Miscellaneous Functions

Unit IV OOPs deployment in VB.NET

Unit V ADO.NET Connectivity
Introduction to ADO.NET – ADO Vs ADO.NET – Connected ADO.NET Architecture – Disconnected ADO.NET Architecture – Data Reader - Data Adapter – ADO.NET Classes –
ADO.NET - Namespaces – Interfacing VB.NET Applications with ADO.NET – Interfacing - ASP.NET Applications with ADO.NET

**Books for Study**


**Reference Books**

Lab Exercises

1. Demonstrate the conditional statements in VB.NET using a console application
2. Demonstrate the looping statements in VB.NET using a console application
3. Develop an application that demonstrates the windows controls
4. Develop a windows application with Menus and Dialog Boxes
5. Demonstrate Multithreaded Programming
6. Demonstrate subroutines and functions
7. Develop an application for deploying various built-in functions in VB.NET
8. Develop an MDI application for Employee Pay-roll transactions
9. Construct a console application to demonstrate the OOP Concepts
10. Demonstrate Events, Delegates, and Interfaces
11. Develop a Windows applications with database connectivity for core-banking transactions
12. Develop a web application for dynamic Login Processing
Objectives
1. To enable the students to learn the basics of data communication.
2. To enable the students to understand the layers functionality.

UNIT I Introduction and physical layer

UNIT II Data link layer

UNIT III Network and transport layer

UNIT IV Application layer

UNIT V Network security
Text Books

Reference Books

NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”
Computer Networks by Prof. Sujoy Ghosh, IIT Karagpur
Computer Networks by Prof. Ajit Pal, IIT Karagpur
Computer Networks by Prof. Hema A Murthy, IIT Karagpur
Data Communications by Prof. Ajit Pal, IIT Karagpur
Data Communications by Prof. H. S. Jamadagni, IISc, Bangalore
Objectives:

1. To enlighten the students on the actual foundations of 2D and 3D graphics and to appreciate the process in projecting 3D scene on a 2D plane.
2. To introduce the theories and practice of components of multimedia

UNIT I Introduction and Output Primitives

UNIT II 2D Graphics
Two Dimensional Transformations - Basic Transformations , Reflection – Shear- 2D Viewing Pipeline – Window to Viewport Mapping - Clipping – Polygons - Splines - Bezier Curves.

UNIT III 3D Graphics

UNIT IV Overview of Multimedia

UNIT V Multimedia Systems and Applications
Multimedia Communication systems – Synchronization Issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive video – Video on Demand – Introduction to VRML.

TEXT BOOKS


REFERENCE BOOKS


NPTEL Video Lectures from Loyola College Intranet under “NPTEL – Video Portal”

Introduction to Computer Graphics by Prof. Prem K. Kalra, IIT DELHI
Computer Graphics by Prof. Prem K. Kalra, IIT DELHI
Computer Graphics by Prof. Sukhendu Das, IIT MADRAS
LAB EXERCISES

1. Program using OpenGL library functions, to implement the basic primitives such as POINT, LINES, QUAD, TRIANGLES and POLYGON etc.
2. Program using OpenGL library functions, to implement the line chart as per user input. Input monthly data for period of one year.
3. Program to draw hard wired house by using basic primitives of OpenGL library functions.
5. Program by using OpenGL library functions, to implement the Bresenham’s Line drawing, Circle drawing, Mid-point Circle drawing and Mid-point Ellipse drawing algorithms.
6. Program by using OpenGL library functions, to implement the Cohen-Sutherland Line clipping algorithm.
7. Program by using OpenGL library functions, to implement the Liang-Barsky Line clipping algorithm.
8. Program to demonstrate 2D and 3D transformations.
9. Window to Viewport Transformation
10. Splines Using OpenGL, 2D Animation
Objectives:
1. To teach methods of s/w project planning.
2. To teach various controlling mechanisms used in s/w projects.

UNIT I INTRODUCTION

UNIT II PROJECT PLANNING AND SELECTION

UNIT III ACTIVITY PLANNING

UNIT IV MONITORING AND CONTROL

UNIT V MANAGING PEOPLE AND ORGANIZING TEAM

Text Books

Reference Books
Objectives:
1. To introduce different hardware and software infrastructure.
2. To teach how to manage storage of information efficiently.
3. To teach the concept of security management.

UNIT I Introduction
Introduction – Information Technology, computer Hardware, computer software, network and Internet, computing resources IT infrastructure- Design issues, requirements IT system management process service management process, information system design, IT infrastructure library.

UNIT II Services
Service delivery process – Service delivery process, service level management, financial management, service management, capacity management, availability management.

UNIT III Service and storage management
Service support process – service support process, configuration management, incident management, problem management, change management, release management. Storage management – Backup and storage, archive and retrieve, disaster recovery space management, database and application protection, bare machine recovery, data retention.

UNIT IV Security management
Security management – Security, Computer and Internet security, Physical security, identity management, access management, intrusion detection, security information management.

UNIT V IT Ethics and Trends

Text Books

Reference Books
SEMESTER IV

CA4806 XML AND WEB SERVICES

Semester : IV
Category: MC
Credits: 4
No of Hours/week:4

Objectives:
1. To educate the students on the basics and technologies of XML thereby helping them to build XML based applications.
2. To analyse the aspects of Web Services and to integrate web based applications.

UNIT I Essentials of XML

Unit – II Building XML Based Applications

Unit-III Architecting Web Services

Unit – IV Web Services Building Blocks

Unit - V XML Security

Text Books
Reference Books

LAB EXERCISES

1) Simple XML file
2) Validating XML document using Internal DTD
3) Validating XML document using External DTD
4) Implementing Predefined Entity
5) External Entity
6) Demonstration of Parameterized Entity
7) Demonstration of Parameterized Entity – Importing definition from DTD
8) Merging and Validating two or more XML documents

9) Validating an XML document using XSD
10) Validating an XML document with attributes using XSD
11) XML with mixed contents
12) Validating an XML document using XSD that implements user defined data type
13) XSD Global attributes and elements.

14) Program to demonstrate the function of XSD Elements

15) Demonstration of INCLUDE element.
16) Demonstration of IMPORT element.
17) Presenting an XML document using CSS
18) Presenting an XML file using XSLT elements

19) Transforming XML using XSLT and implementing XPath – Nodeset functions
20) Transforming XML using XSLT and implementing XPath – number functions
21) Traversing XML file using DOM

22) Displaying contents of an XML document in a data grid.
23) Dynamically creating XML document during runtime
24) Dynamically accepting user input and creating an XML file.

Web Services
26) Creating a Web Service.
27) Creating and invoking a Web Service
CA4808 RESOURCE MANAGEMENT TECHNIQUES
Semester : IVCredits: 3
Category: MC No of Hours/week:4

Objectives
1. To impart the knowledge of managing the resources in a software project.
2. To teach algorithms pertaining to Networks.
3. To impart the skills of effective decision making

UNIT-I Linear Programming model
Introduction and Applications of Resource Management Techniques – Mathematical
Formulation – Graphical solution – Simplex method – Artificial variable techniques –
Variants of simplex method – Revised simplex method.

UNIT- II Transportation and Assignment model
Mathematical formulation of transportation problem – Methods for finding initial basic
feasible solution – optimum solution – degeneracy – Mathematical formulation of

UNIT- III Decision Analysis and Game Theory
Decision Making under Certainty – Decision under Risk – Decision under Uncertainty –
Game Theory – Two Person Zero-Sum Games – Mixed Strategy Games.

UNIT- IV Network Models
Shortest-Route Problems – Maximal Flow Problems – Network Construction – Critical
Path Method – Project Evaluation and Review Technique – Resource Analysis in
Network Scheduling.

UNIT-V Queuing Models
Characteristics of Queuing Models – Poisson Queues (M/M/1): (FIFO/∞/∞),
(M/M/1): (FIFO/N/∞), (M/M/C): (FIFO/∞/∞) models.

Text Books
   Education.
   Publication.

Reference Books
   2003, Macmillan India.
3. Prem Kumar Gupta, D.S. Hira, Operations Research, S.Chand
Objective:
1. To introduce the basic concepts of mobile computing.
2. To enable the students to develop mobile applications.

Unit I Introduction to mobile computing
Introduction—evolution -- mobile computing functions—mobile computing devices—middleware and gateways—application and services-- mobile computing architecture: 3 tier --design considerations for mobile computing—cellular concepts—multiple access techniques: FDMA—TDMA—CDMA-- SDMA—TDD—FDD-- mobility management—Call control—power management.

Unit II Cellular Technologies

Unit III Short range wireless communication

Unit IV Mobile devices and protocols

Unit V Databases and Applications
Databases:Data organization—database transactional models—query processing—data recovery rocess—data catching—client server computing—adaptation software—power aware mobile computing—context aware mobile computing—delivery mechanisms--Applications: mCommerce—mPayment—Location based services(LBS)—Wireless sensor network:- -- Mobile adhoc networks. Introduction to simulator: A simple application.
Text Books

Reference Books
CA4954 ADVANCED JAVA PROGRAMMING
Semester : IV                                                                                          Credits:4
Category: ES                                                          No of Hours/week:4

Objectives
1. To enhance the knowledge in advanced features of Java
2. To empower programming skill as per the industry need
3. To occur the real time project development skills in Java platform.

Unit I J2EE Introduction
Enterprise Architecture- objectives- Introduction to java EE Platform- Features-
Exploring Java EE platform – Architecture – Containers - Java EE applications – Servers
for Java EE applications. Web applications – HTTP protocol – Introduction to web
applications – Web container – web architecture – Model–view controller (MVC)
arithmetic. Exploring JDBC process.

Unit II Servlets
Servlets Features – 3-Tier applications – Servlet API – Explaining servlet life cycle -
Creating sample servlet – working with ServletConfig, ServletContext, HttpServletRequest and HttpServletResponse –
Implementing servlet collaboration – Session tracking Mechanisms — configure and
running. Exploring session tracking mechanism - Java servlet API for session tracking.
Implementing event handling in servlet – working with wrappers.

Unit III JavaServer Faces (JSF)
JSF features – Architecture – JSF elements – Request processing life cycle - understand
faces configuration file – structure of Facelet pages – understanding core tag libraries –
UI components - working Beans - Designing navigation – validating and converting
data – creating resource bundles – configuring JSF applications - developing JSF
Employee backing bean– working with JSF lifecycle events – configuring and deploying
JS apps.

Unit IV Enterprise java applications (EJB)
Fundamentals – classifications – Session bean: introduction - implementation Message
Driven Bean (MDB): Character – Structure – Life cycle - Implementation of MDB –
Managing transactions in java EE applications - EJB timer services – Implementation of
timer – EJB interceptors – working with interceptor classes - lifecycle callback methods
in an interceptor class – method in MDB – method in session bean.
Unit V Java Persistence API (JPA)

- Introduction to the Java Persistence API - Entity Manager – Introduction to Entities – Lifecycle of entity – understanding Entity Relationship types – mapping collection based relationship – Understanding Entity Inheritance - The Java Persistence Query Language (JPQL) – JPQL functions, statements - Clauses - query API - Creating a simple application in JPA – Configuring the application.

Text Books


Reference Books

5. Andrew Lee Rubinger, Bill Burke “Enterprise JavaBeans 3.1” Sixth Edition 2010, O’REILLY.
Lab exercises

1. Creating simple JDBC application.
2. Creating servlet with simple objects.
3. Creation of login form servlet (Creating and managing session).
4. Creating online shopping application Session tracking.
5. Build a simple JSF based UserInterface.
7. Working with stateless session Bean.
8. Working with Stateful Session Bean.
9. Simple application packing, deploying and running in MDB.
10. Package and deploy a simple JSF web application using Netbeans (or any other IDE).
11. Creating a Simple JPA application.
CA4956 ADVANCED .NET TECHNOLOGIES

Semester : IV  Credits:4
Category: ES  No of Hours/week:4

Objectives
1. To instill the productivity of C#
2. To inculcate skills to develop enterprise mobile solutions using ASP.NET
3. To orient students on Windows Phone Application Development

Unit I Building-blocks of C#
C# the Trailblazer – Productivity of C# - Features, and Advantages – C# Vs. Java – Overview of C# - Gaining momentum with C# programs in VS.NET – Keywords – Data Types, Literals, and Variables – Value Types, Integers, Floating-Point Types, The Decimal Type, Characters, The Bool Type - Literals – Character Escape Sequences - Working with Variables – Scope, Type Conversion and Casting - Operators – Program Control Structures – Classes and Objects – Arrays and Strings

Unit II Advanced Programming concepts in C#

Unit III Features-rich Web Application Development using ASP.NET
Introduction to ASP.NET - Advantages of ASP.NET - ASP.NET Architecture – ASP Vs. ASP.NET - ASP.NET Page’s Structure - Sample Program in ASP.NET - Page Events - HTML Server Controls - Basic Web Server Controls - Data List Web Server Controls - Validation Controls - Web User Controls in ASP.NET

Unit IV Intrinsic Objects, and Security Mechanism in ASP.NET
Unit V Introduction to Windows Phone Apps Development
Mobile Application Development – Featured Phone Vs. Smart Phone – Smart Phone OSs
– Introducing Windows Phone 7 and the Windows Phone Platform - Building Windows
Phone 7 Applications - Using Cloud Services as Data Stores - Catching and Debugging
Errors - Packaging, Publishing, and Managing Applications

Text Books

Reference Books
CA4957 ADVANCED .NET TECHNOLOGIES LAB
Semester: IV                                      Credits: 2
Category: ES                                      No of Hours/week:4

Lab Exercises

1. Develop a control application to demonstrate the control structures in C#
2. Demonstrate Indexers and Properties
3. Demonstrate Interfaces, Structures, and Enumerations
4. Demonstrate Delegates, and Events
5. Demonstrate the working mechanism of PLINQ
6. Develop a web application to demonstrate various web server controls
7. Demonstrate the validation controls in ASP.NET
8. Demonstrate caching in ASP.NET
9. Demonstrate the intrinsic objects in ASP.NET
10. Develop a web application for students’ information management with crystal reports
11. Demonstrate LINQ to an SQL application
12. Develop a basic Windows Phone Application
Objectives:
1. To impart the basics of computer networking.
2. To train in installation and configuration of web servers.
3. To train in network monitoring mechanisms.

UNIT I Introduction to Computer Networks Devices

UNIT II Base Layers

UNIT III Subnetting – CIDR – VLSM
Subnetting IP addresses – Subnet Mask – Subnetting Class A, Class B and Class C Addresses – Classless Inter-domain Routing (CIDR) – Variable Length Subnet Mask (VLSM).

UNIT IV Networking Services
Domain Name Service (DNS) -Introduction to DNS, Installation of DNS Server, DNS Zones, Forward look up zone, Reverse look up zone, DNS Resource records, Name resolution by DNS clients, Primary DNS, Secondary DNS, Zone Transfers, DNS Root, DNS Messages, Positive, Negative and Authoritative responses – DNS Resolver Cache memory.
Dynamic Host Configuration Protocol (DHCP) -DHCP service, DHCP Scope and Ranges, Leasing IP addresses, Lease period, T1 and T2 value, DORA process, Alternate configuration of TCP/IP under DHCP, Reservation, Binding MAC address to specific clients.
UNIT V Wide Area Network

Text Books

Reference Books
Objectives:
1. To impart skills of managing databases in a software industry.
2. To impart skills of giving security to database.

Unit I Working with Database
Understanding Database Architecture – Installation – Creating Database – Configuring Database – Deleting and dropping Database – Starting and Stopping Database.

Unit II Administering Tablespace and Managing Users
Creating, editing and deleting Tablespaces – Retrieving the tablespace information – Managing Database with users, roles and privileges – Creating password for users.

Unit III Database Management Essentials

Unit IV Managing Consistency and Concurrency and Database Tuning

Unit V Backup and Recovery
Types of Database Failure – Types of Database Backups – Data that need to be backed up – Recovery of the data - Restoring database.

Text Book

Reference Books
5. Ian Abramson, Michael S. Abbey, “Oracle Database 10g: A Beginner’s guide”.
SEMESTER V

CA5805 SOFTWARE TESTING

<table>
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<tr>
<th>Semester : V</th>
<th>Credits:4</th>
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<td>No of Hours/week:4</td>
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Objectives
1. To teach the concept of how to test a software to uncover bugs.
2. To teach how to manage a testing project.
3. To meet the demands of IT industry by producing more testers.

UNIT I Testing Methods

UNIT II Levels of Testing

UNIT III Test Planning and Execution

UNIT IV Web Application

UNIT V Achieving Quality through Testing

Discussion of case studies using IBM Rational Functional Tester and Free/Open source Testing tool.
**Text Books**


**Reference Books**

CA5806 KNOWLEDGE MANAGEMENT SYSTEMS

Semester: V  
Category: MC  
No of Hours/week: 4  
Credits: 4

Objectives
1. To infuse the importance of Knowledge for organizational survival and success
2. To train the students on Knowledge Creation, Codification, and Capturing
3. To empower the students to implement Knowledge Management Systems for organizations

Unit I Introduction to KMS

Unit II Transmuting Information into Knowledge

Unit III Knowledge Creation and Capture
Knowledge creation – Nonaka’s model of knowledge creation and transformation – Knowledge Architecture – The people core, Identifying Knowledge Centers – The Technical core, Build In-home, buy or outsource model – Capturing Tacit knowledge – Evaluating the Experts – Developing relationship with Experts – The Interview as a tool – Guide to a successful Interview with the Expert

Unit IV Knowledge Codification and System Implementation

Unit V KMS Tools and Portals
Organizational Memory – Knowledge Portals, the basics- The Business Challenge-Knowledge Portal Technologies – Key functionality – Collaboration – Content Management – Intelligent Agents – Knowledge Workers – Managing the Knowledge Projects
Text Books

Reference Books
Objectives:
1. To introduce the concept of Data Warehousing
2. To expose to various Data Mining techniques
3. To impart the knowledge of how Data Mining could be used to solve scientific and social problems.

UNIT I Introduction and Data preprocessing

UNIT II Classification and Prediction Techniques

UNIT III Cluster Analysis

UNIT IV Data Mining Technologies
Mining object, spatial, multimedia, text and web data: Multidimensional analysis – Spatial Data mining – Multimedia data mining – Text Mining – Mining the World Wide Web - Graph Mining – Social Network Analysis – Multi relational Data Mining.

UNIT V Applications and Tools
Applications of Data Mining - Social Impacts of Data Mining –Tools: An Introduction to spread sheet based data mining tools - Case Studies.

Text Books
1. Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 2002.

Reference Books
3. Usama M.Fayyad, Gregory Piatetsky - Shapiro, Padhraí Smyth And Ramasamy
CA5808 CLOUD COMPUTING
Semester : V Category: MC
Credits: 4 No of Hours/week: 4

Objectives
1. To acquire the knowledge of tapping the existing resources and use them effectively.
2. To acquire the knowledge of minimizing the software resources and thereby reducing the cost of investment.
3. To impart the skills of making greener IT.

UNIT I Distributed Computing-An Introduction

UNIT II Cloud Computing

UNIT III Cloud Service Models

UNIT IV Cloud Deployment Models

UNIT V Cloud Issues And Challenges

Text Books

Reference Books
CA5809 SOFTWARE DEVELOPMENT LAB

Semester : V  Credits:2
Category: MC  No of Hours/week:4

Objectives:

1. To develop skills for developing an application oriented software
2. To train the students to apply software engineering methodology
3. To prepare them to take up project in final semester.

Students have to choose a project and submit the proposal to the coordinator. After the scrutiny, the coordinator will allot guide. Student has to do the project in lab. Minimum two review meetings will be conduct the progress of the student. At the end, student has to show demo of what he/she developed during lab class hours.
Objectives:

2. To teach how to apply neural networks for cluster analysis.

UNIT I
Introduction to Neural Networks - Basic models - Concepts of Neural Networks - Inference and Learning Classification Models - Association Models - Optimisation Models - Self-organisation Models - Introduction to MATLAB.

UNIT II
Supervised and Unsupervised Learning - Statistical Learning - AI Learning – Neural Network Learning - Rule Based Neural Networks - Network Training - Network Revision - Issues - Theory of Revision Decision Tree Based NN - Constraint Based NN.

UNIT III

UNIT IV

UNIT V

Text Books
1. Limin Fu “Neural Networks in Computer Intelligence”, 2003, McGraw Hill Companies.


Reference Books
Lab Exercises

1. Construct a simple neuron to demonstrate AND gate.
2. Experiment Adaptive Linear Element (ADALINE)
3. Experiment Multiple Adaptive Linear Element (MADALINE) for various bias units.
4. Build Neural network for any given decision tree.
5. Implement Back Propagation Network to demonstrate XOR gate.
6. Construct a Bidirectional Art Map to store pairs of vectors.
7. Implement Boltzman simulator.
8. Implement Counter Propagation Network to recognize alphabets of your choice.
9. Simulate Self Organising Map (SOM) and experiment with different time periods,
10. Simulate Adaptive Resonance Theory (ART) networks for pattern matching.
11. Design a Hopfield network to solve Travelling Salesman problem.
12. Implement two layer perceptrons to analyse given patterns.
13. Construct a single layer neural network for a continuous function.
14. Construct a Neural network system to demonstrate Bayesian Classification.
CA5957 NETWORK SECURITY

Semester : V  Credits: 4
Category: ES  No of Hours/week: 4

Objectives:
1. To introduce the fundamentals of network security.
2. To give awareness of various threats.
3. To teach various cryptographic algorithms to protect data.

UNIT I Introduction to Network Security

UNIT II Security Threats and Vulnerabilities

UNIT III Introduction to Cryptosystems

UNIT IV Symmetric & Asymmetric Encryption Methods

UNIT V Introduction to Firewall
Text Books

Reference Books
LAB EXERCISES

1. Implementing a simple client/server application using sockets and TCP/IP
2. Using open SSH
3. Port forwarding.
4. Sniffing.
5. Proactive filtering of weak pass words and salting passwords.
6. Using open SSH for communication confidentiality and integrity.
7. Using open SSL to set up a simple certifying authority.
8. Issuing and verifying certificates to avoid MITM attacks.
9. Setting up of a firewall.
10. Setting up of IP Sec virtual private network (VPN).
11. Packet capturing and packet replay attack.
12. ARP spoof, DNS spoof attacks - man in the middle attacks demonstration.
13. Logic for brute force attacks.
14. Program that using hashing technique.
   Encryption and decryption of files program.
Objectives

1. To impart the fundamentals on different forms of accounting
2. To understand financial and management accounting by explaining how the latter is used by internal decision makers
3. To empirically demonstrate how an organization’s mission, goals, and investment strategies affect the different facets of management accounting

Unit I Introduction to Accounting
Accounts, Accounting, and Accounting – Conventions Types of Book-keeping – Branches of Accounting – Financial Accounting, Cost Accounting, Management Accounting - Definition for Management Accounting – Nature and Scope of Management Accounting – Characteristics - Difference between Management Accounting and Balance Sheet – Tools and Techniques in Management Accounting

Unit II Ratio Analysis

Unit III Fund Flow Statement Preparation

Unit IV Budgetary Control and Marginal Costing
Budget - Essentials of Successful Budgetary Control – Classification of Budget based on Functions – Sales Budget, Production Budget, Purchase Budget, Cash Budget, Zero-Base Budgeting - Intro to Marginal Costing and Break-even Analysis

Unit V Capital Budgeting
Definition – Significance – Factors affecting the Capital Expenditure Projects – Methods of Capital Budgeting – Traditional Methods – Pay-back Period Method, Modern Pay-back Period Method, Average Rate of Return (ARR) – Discounted Cash Flow Method - Net Present Value (NPV), Profitability Index (PI), Internal Rate of Return (IRR) Method

Text Books

Reference Books

Objectives
1. To inculcate the significance of Soft-skills both for personal and professional success
2. To orient the students to imbibe positive attitude
3. To enable the students to muster effective verbal and non-verbal communication

Unit I Soft-Skills Introduction

Unit II Developing Positive Attitude
Introduction – Meaning – Features of Attitudes – Attitudes and Behavior – Formation of Attitudes – Change of Attitudes – Ways of changing Attitudes – Attitudes in Workplace-The power of positive Attitude- Developing Positive Attitude – Obstacles in developing Positive Attitude

Unit III Active Listening and Effective Public Speaking
Differences between Listening and Hearing – Critical Listening – Barriers to Active Listening – Improving Listening – Ethical Listening – Effective Public Speaking – Selecting the topic for public speaking – Understanding the audience – Evidence and Research – Organizing the main ideas – Language and Style choice in the speech – Delivering the speech

Unit IV Persuasive Writing
Introduction – Importance of writing – Creative Writing – Writing Tips – Writing powerful email communication – Using appropriate salutations – Making subject matter significant – Anticipating, Empathizing, and understanding others while sending emails – Do and Don’ts in email communication

Unit V Effective Body Language

Text Books
Reference Books
Objectives

1. To impart the skills of solving problems quickly and efficiently.
2. To give practice of facing Aptitude Test conducted by IT industry confidently.

Unit I Manipulation with Numbers

Unit II Different Forms of Ratio

Unit III Business Arithmetics
Percentage – Profit & Loss – Simple Interest – Compound Interest – Stocks & Shares – True Discount – Banker’s Discount.

Unit IV Area, Volume and Permutations

Unit V Data Interpretation

Text Book


Reference Book

Students of VI semester have to do project throughout the semester in any application in a software company to gain practical knowledge of what they have studied in five semesters and they have to submit a report which will be evaluated by conducting project viva at the end of the semester. Their progress is monitored continuously to award the internal assessment marks.