

GOVERNMENT COLLEGE OF ENGINEERING, AURANGABAD

(An Autonomous Institute of Government of Maharashtra)

Department of MCA

Proposed Teaching and Evaluation Scheme for Choice Based Credit System -Second Year M.C.A.

Effective From A.Y. 2018-19

SEMESTER III

THEORY COURSES												
Sr. No	Course Code	Subject	Scheme of Teaching (Hrs/Week)			Total Credits	Scheme of Evaluation (Marks)					
			L	T	P		Theory			Term Work	Practical /Viva-voce	Total
							Test	TA	ESE			
1	MC2001	Core Java	3	1		4	20	20	60	-	-	100
2	MC2002	Advanced Database Management System	4	0		4	20	20	60	-	-	100
3	MC2003	Software Engineering	3	1		4	20	20	60	-	-	100
4	MC2004	Information Security	3	0		3	20	20	60	-	-	100
5	MC2005 to MC2007	Elective – II										
		1) Image Processing 2) Network Analysis and Management 3) Android Programming	3	0		3	20	20	60	-	-	100
LABORATORY COURSES												
1	MC2008	Lab: Core Java	-	-	4	2	-	-	-	25	50	75
2	MC2009	Lab: Advanced Database Management System	-	-	4	2	-	-	-	25	50	75
3	MC2010	Seminar			2	1				25	25	50
4	MC2011 to MC2013	Lab: Elective – II			2	1				25	25	50
		TOTAL	16	2	12	24	100	100	300	100	150	750

SEMESTER IV

THEORY COURSES

Sr. No	Course Code	Subject	Scheme of Teaching (Hrs/Week)			Total Credits	Scheme of Evaluation (Marks)					
			L	T	P		Theory			Term Work	Practical Viva-voce	Total
							Test	TA	ESE			
1	MC2014	Advanced Java	3	1		4	20	20	60	-	-	100
2	MC2015	Distributed Databases	3	1		4	20	20	60	-	-	100
3	MC2016	Software Testing Techniques	3	0		3	20	20	60	-	-	100
4	MC2017	Cloud Computing	3	0		3	20	20	60	-	-	100
5	MC2018 To MC2021	Elective- III 1) Data Mining and Warehousing 2) Python Programming 3) Mobile Computing 4) Pattern Recognition	4	0		4	20	20	60	-	-	100

LABORATORY COURSES

1	MC2022	Lab: Advanced Java	-	-	4	2	-	-	-	25	50	75
2	MC2023	Lab: Software Testing Techniques	-	-	2	1	-	-	-	25	25	50
3	MC2024	Lab: Cloud Computing			2	1				25	25	50
4	MC2025 To MC2028	Lab: Elective - III			4	2				25	50	75
		TOTAL	16	2	12	24	100	100	300	100	150	750

L-Lectures, T-Tutorials, P-Practical's, TA-Teacher Assessment, ESE-End-Semester Examination

SEMESTER III

MC2001: Core Java

Teaching Scheme

Lectures: 3 hrs/week

Tutorials: 1

Total Credits: 4

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

1. Understand fundamentals of ObjectOriented programming in java, including defining classes, invoking methods, using class libraries etc,
2. Be able to use the java SDK environment to create, debug and run simple javaprograms.

Course Outcomes Expected:

1. Create Java application programs using sound OOP practices (e.g., interfaces and APIs)
2. Use testing and debugging tools to automatically discover errors of Java programs
3. Develop programs using the Java Collection API as well as the Java standard class library.
4. Develop programs to handle database using Java Application.
5. Develop Programs to create GUI .

Course Contents :

1.JavaFundamentals

Introduction to Java: History and evolution of Java,Java features, Java vs other popular languages, Java programming environment, Installing Java, Exploring the IDE, JVM, command line arguments,Bytecodes And The Java Virtual Machine, Application And Applets, The Java Class Libraries, The Java Development Kit (Jdk), Identifiers, Keywords &Types–Variables And Assignments, Strings And Characters, Arithmetic Operators And Expressions, Type Conversion and Casting,The New Operator, Garbage Collection, Other Wrapper Classes, The String Buffer Class, Arrays Of Objects, Command Line Arguments.

2.Java MemoryModel

Objects and classes, declaring objects, constructors, The General Form Of A Class, Creating Simple Classes, Method Overloading, Adding Constructors, The This Keyword, Instance Variables And Methods, Static Variables And Methods, Local Variables And Variable Scope, Argument Passing, Introduction to Inner Classes Inheritance–Subclasses, Inheritance And Variables, Method Overriding, Inheritance And Methods,inheritance And Constructors, Class Modifiers, Variable Modifiers, Constructor Modifiers, Method Modifiers, Interface And Packages, Interfaces, Interface References, Interface Inheritance, The Instance Of Operator, Packages, Classpath, The Import Statement, Access Control And Packages,

3.Multithreading and Exceptions File handling

Multithreading :Lifecycle of Thread, Thread Scheduler, Thread Priority,Daemon Thread, Exception Handling :Try Catch Multiple Catch, throw,Difference between final, finally and finalize, File Handling : Java I/O, stream,Outputstream,Inputstream, Dataoutputstream, DataInputstream.

4.Collection and JDBC

The Collection Framework in Java: Collection Class, Array List & linked list Classes, Inserting elements, HashSet and TreeSet Classes. Algorithm Support to Collection Classes Java Database Connectivity (JDBC): Understanding JDBC Classes, Performing CRUD (create, read, update and delete) Operations, Joining, Manipulating Databases with JDBC, Transaction Processing, Stored Procedures

5.GUI Programming

An Overview Of Applets, Your First Java Applet, The Life Cycle Of An Applet, The Graphics Class, Using Colors, Displaying Text, Using Applets In A Web Page Event Handling The Delegation Event Model, Event Classes, Event Listeners, Adapter Classes, Advance Language Features, Inner Classes, Anonymous Inner Classes, The Abstract Window Toolkit, Labels, Buttons, Canvases, Check Boxes, Choices, Text Fields And Text Areas, Lists, Scroll Bars, Grid Layout, Panels, Windows And Frames, Menus And Menu Bars, Overview Of JFC (Java Foundation Classes), Swings & AWT Component Hierarchy

Tools Used –

JDK 1.4 / 1.5, TextPad / EditPlus, java, javac, jar, javaw, javap

Text/Reference Books –

- 1.Java 2 Complete Reference – Herbert Schildt and Patrick NaughtonMcGrawHill
- 2.Programming with JAVA – E. Balgurusamy, 2nd Ed,TMH
- 3.Thinking in Java – Bruce Eckel - 3rd EditionPrentice-Hall
- 4.Java Swing, 2nd Edition by Dave Wood, Marc Loy, James Elliott, Brian Cole, Robert EcksteinOReilly
- 5.Core Java – Part 1 – Sun Microsystemspress
- 6.A Programmer's Guide to Java Certification – Khalid Mughal, RolfRasmussen

MC2002: Advanced Database Management System

Teaching Scheme

Lectures: 4hrs/week

Tutorials: 0

Total Credits: 4

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

1. To describe the design of Distributed Databases and object databases.
2. To discuss various concepts of long duration transaction through (nested transactions, workflows, sagas).
3. To determine the process of Query processing and evaluation for distributed and parallel databases.

Course Outcomes Expected:

After Completing, the course student will be able to

1. Design an Object Oriented DBMS.
2. Design distributed /parallel DBMS.
3. Select appropriate transaction model.

Course Contents :

1 Introduction to Database Security

Distributed Databases and Client-Server Architectures, Distributed Database Concepts ,Data Fragmentation, Replication,Allocation Techniques for Distributed Database Design, Types of Distributed Database Systems, Query Processing in Distributed Databases, Overview of Concurrency Control and Recovery in Distributed Databases, An Overview of 3-Tier Client-Server Architecture, semi joins, query optimization, concurrency control and heterogeneity issues, Spatial data management

2 Object based Databases

Foundations of Database Transaction Processing : Need for Object oriented databases, object identity,Object structure, Type constructors (object identity and its implementation) Complex data types: Structured & unstructured, Structured types and Inheritance in SQL, Type Inheritance, Table Inheritance, Implementation of multivalued attributes & composite attributes, Persistent programming languages, client server object basis, Parallel databases: Introduction,Parallel database architecture, query and Intra-query parallelism,

3 Oracle System Architecture

Oracle system architecture, process structures, database, initialization, control, data and redo log files,, Data file management, Server parameter file (SPFile), online table redefinition, dynamic SGA, Constraint enhancement, Backup and recovery features, Crash Coherence

4 Object Relational Features of Oracle

Refer Oracle 10 g Manual : OR features

Oracle Objects

Advantages of Objects

Key Features of the Object-Relational Model

1. Object Types
2. Objects
3. Object Methods
4. Type Inheritance
5. Type Evolution
6. Object Tables
7. Row Objects and Column Objects
8. Collection Types Varrays (for multivalued attributes), Nested Table(for many to many relationships)
9. Object Relationships: Unidirectional and Bidirectional
10. Create, Insert , Delete operations on: Varrays and Nested Tables
11. ADD : XML & Databases

5 Web Database Connectivity

Application Design and Development: User Interfaces and Tools , Web Interfaces to Databases , Web Fundamentals , Servlets and JSP , Building Large Web Applications, Execution model, JSP Scripting Elements: Expressions, Scriptlets, and Declarations, Implicit Objects, Connecting Oracle using JSP.

Text/Reference Books:

1. Database system concepts: H. Korth and A. Siberchatz, S. Sudarshan
2. Fundamentals of database systems: R. Elmasri, S. Navathe, Benjamin Cummings.
3. C.J.Date, A.Kannan and S.Swamynathan,"An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.
4. The Complete Reference JSP 2.0 , TMH
5. Java Server Pages , Larne Pekowsky, Addison Wesley

Oracle 10 G manuals

MC2003: Software Engineering

Teaching Scheme

Lectures: 3 hrs/week
Tutorials: 1
Total Credits: 4

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Educational Objectives:

1. Understand the processes involved in SDLC lifecycle.
2. Know the how requirement can be gathered through requirement engineering.
3. Learn the how to design the system and do the data mapping.
4. Recognize the importance of Golden Rules.
5. Learn the basic software testing strategy.

Course Outcomes Expected:

After completion of this course, students will be able to:

CO1: Aware of basic computer engineering concept through SDLC life cycle and Models in software engineering.

CO2: Integrate the requirement from customer for software development.

CO3: Apply the design concept to develop the system.

CO4: Apply the Golden Rules for user interface level design.

CO5: Formulate test strategy and ethically work to achieve the quality of product.

Contents:

1. History and overview:

Indicate some important topic areas such as software process, requirements, specifications, design, testing, validation, evolution and project management, examples for software engineering approach, importance of language selection when doing software design, importance of testing and validation in software projects, explore some additional resources associated with software engineering, purpose and role of software engineering in computer engineering.

2. Software processes, requirements and specifications: Software life cycle and process models, Process assessment models, software process metrics for the development and maintenance of diverse software products, Requirements elicitation, Requirement analysis modeling techniques, functional and nonfunctional requirements, prototyping, Basic concepts of formal Specification techniques.

3. Software design: Fundamental design concepts and principles, software architecture, structured design, object-oriented analysis and design, component-level design, design for reuse.

4. Software testing and validation: Validation planning, testing fundamentals, including test plan creation and test case generation, black-box and white-box testing techniques, unit, integration, validation, and system testing.

5. Software evolution :Software maintenance: the different forms of maintenance, the associated disciplines and the role and the nature of the configuration management, characteristics of maintainable software, software reuse strengths and weaknesses, reengineering.

Text books :

- 1.“Software Engineering” – Roger S. Pressman, TMH
- 2.Shrinivasan, Gopaldaswamy, “Software Testing” – Pearson Education
- 3.William Perry, “Effective Methods for Software Testing”, John Wiley & Sons, New York, 1995.
- 4.CemKaner, Jack Falk, Nguyen Quoc, “Testing Computer Software”, Second Edition, Van Nostrand Reinhold, New York, 1993.
- 5.BorisBeizer, “Software Testing Techniques”, Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
- 6.LouiseTamres, “Software Testing”, Pearson Education Asia, 2002

MC2004: Information Security

Teaching Scheme

Lectures: 3 hrs/week

Tutorials: 0

Total Credits: 3

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

- To Discuss the importance of IS security
- To demonstrate protecting the privacy and confidentiality of data
- To Know/understand the security and privacy and how to apply them
- To identify management, technical, personnel, operational, and physical security controls
- To expose students to the security requirements for protecting workstations and the information processed on them
- To discuss general physical/environmental security requirements
- General understanding of network security

Course Outcomes Expected:

After Completing the course student will be able to

- Identify external and internal threats to an organization
- Aware about information security and its importance
- Identify how threats to an organization are discovered, analyzed, and dealt with
- Discuss fundamentals of secret and public cryptography
- Develop protocols for security services
- Analyze network security threats and countermeasures
- Discuss & design security solutions for network using available secure solutions (such as PGP, SSL, IPSec, etc)
- To be exposed to original research in network security

Contents:

1. Information Security: Introduction to information hiding, information hiding in noisy data, a survey of steganography techniques, watermarking.

2. Network Security Practice: Authentication Application – Electronic Mail Security – IP Security Program Security and System Security: Secure programs – No malicious program errors – viruses and Worms – Memory and address protection – control access to general objects – File protection mechanism – user authentication – Trusted operating system design and assurance – Intrusion Detection system.

3. Symmetric Encryption and Message Confidentiality : Symmetric Encryption Principles, Symmetric Block Encryption Algorithms, Random and Pseudorandom Numbers , Stream Ciphers and RC4 ,Cipher Block Modes of Operation ,Recommended Reading and Web Sites , Key Terms, Review Questions ,and Problems

4. Public-Key Cryptography and Message Authentication :

Approaches to Message Authentication , Secure Hash Functions , Message Authentication Codes , Public-Key Cryptography Principles , Public-Key Cryptography Algorithms , Digital Signatures , Recommended Reading and Web Sites , Key Terms, Review Questions, and Problems

5. Biometrics security:

Biometric identification, verification, authentication, different biometric techniques, biometric design steps, biometric template, and biometric template security.

Text book

1. Information Security and cyber laws, Saurabh Sharma, student series, Vikas publication Charles P. Pfleeger,
2. Shari Lawrence Pfleegner, "Security in Computing", Prentice Hall of India, 2007.
3. William Stallings, "Cryptography and Network Security", 5th Edition, Pearson.
4. John W. Rittinghouse, James F. Ransome, "Wireless Operational Security", Elsevier, 2004.
5. Ron Ben Natan, "Implementing Database Security and Auditing", Elsevier, 2005.
6. Lincoln D. Stein, "Web Security", Addison Wesley, 1999.
7. Ingemar J. Cox, Matthew L. Miller Jeffrey A. Bloom, Jessica Fridrich, Ton Kalker, "Digital Watermarking and Steganography", 2nd Edition, Elsevier.
8. Dr. R. K. Tiwari, P. K. Sastri, K. V. Ravikumar, "Computer Crime and Computer Forensics", 1st Edition, Selective Publishers, 2002.

ELECTIVES

MC2005: Image Processing

Teaching Scheme

Lectures: 3 hrs/week

Tutorials: 0

Total Credits: 3

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

- Introduce the scope of field of image processing and basic concepts in digital image processing.
- Demonstrate different of image enhancement techniques.
- Describe different segmentation & compression techniques.
- Analyze different morphological techniques.
- Construct a model for object recognition.

Course Outcomes Expected:

After completion of this course student will be able to

CO1: Describe the theory and algorithms that are widely used in digital image processing K2

CO2: Apply a proper image enhancement technique for given a set of noisy images. K3

CO3: Compare different image segmentation and compression techniques. K3

CO4: Formulate solutions using morphological concepts. K3

CO5: Develop any application using different image processing techniques. K4

Contents:

Digital Image FundamentalsA simple image model, Sampling and Quantization, Imaging Geometry, Digital Geometry, Image Acquisition Systems, Different types of digital images.

Bilevel Image Processing: Basic concepts of digital distances, distance transform, medial axis transform, component labeling, thinning, morphological processing, extension to grey scale morphology.

Binarization and Segmentation of Grey level images: Histogram of grey level images, Optimal thresholding using Bayesian classification, multilevel thresholding, Segmentation of grey level images, Water shade algorithm for segmenting grey level image.

Detection of edges and lines in 2D images: First order and second order edge operators, multi-scale edge detection, Canny's edge detection algorithm, Hough transform for detecting lines and curves, edge linking.

Images Enhancement: Point processing, Spatial Filtering, Frequency domain filtering, multi-spectral image enhancement, image restoration.

Color Image Processing: Color Representation, Laws of color matching, chromaticity diagram, color enhancement, color image segmentation, color edge detection, color demosaicing.

Image Registration and depth estimation: Registration Algorithms, Stereo Imaging, Computation of disparity map.

Image compression: Lossy and lossless compression schemes, prediction based compression schemes, vector quantization, sub-band encoding schemes, JPEG compression standard, Fractal compression scheme, Wavelet compression scheme.

References

1. Gonzalez and Woods, Digital Image Processing, Prentice-Hall.

MC2006: Network Analysis And Management

Teaching Scheme

Lectures: 3 hrs/week

Tutorials: 0

Total Credits: 3

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

- Appreciate the need for interoperable network management
- Understand general concepts and architecture behind standards based network management
- Understand concepts and terminology associated with SNMP and TMN
- Appreciate network management as a typical distributed application
- Get a feeling of current trends in network management technologies
- Understand Advanced Information Processing Techniques such as Distributed Object Technologies, Software Agents and Internet Technologies used for network management
- To understand the principles of network management, different standards and protocols used in managing complex networks. To understand the
- Automation of network management operations and making use of readily available network management systems.

Course Outcomes :

After the completion of course, the student will able to

- Acquire the knowledge about network management standards (OSI and TCP/IP)
- Acquire the knowledge about various network management tools and the skill to use them in monitoring a network
- Analyse the challenges faced by Network managers
- Evaluate various commercial network management systems and open network management systems.
- Analyse and interpret the data provided by an NMS and take suitable actions.

Course Contents:

1. Introduction

Requirement Analysis Concepts – Network design issues, Requirement Analysis Process – The Basic Ingredients of Network Management ,Flow Analysis, Routing and forwarding, resource allocation, general principles of network design, network characteristics,

2. ARCHITECTURE Network Architecture – Addressing and Routing Architecture – Performance architecture – Security and Privacy Architecture – Network Analysis Tool

3. NETWORK MANAGEMENT Network Management Overview - Management Perspective: Dimensions of the Management: Management Interoperability, Management Life cycle, Management Layers – Management functions and reference models

4. NETWORK MANAGEMENT ORGANIZATION AND SNMP PROTOCOL MODEL

Management Information – Management Communication Patterns: Rules of conversation. Common Management Protocols – Management organization. Current SNMP Broadband and TMN

management, Network management standards.SNMPV1, SNMPV2 system architecture, SNMPV2, structure of management information. SNMPV2 – MIB – SNMPV2 protocol, SNMPV3-Architecture,

5. MANAGEMENT INTEGRATIONApplied Network Management: Management Integration – Service Level Management – Management Metrics: Assessing Management Impact and Effectiveness – Case Study: NMS, Organization Network

Text/Reference Books:

1. James D.McCabe, Network Analysis, Architecture and Design, 3rd Edition, Elsevier, 2007.
2. Alexander Clemm, Network Management Fundamentals, 1st Edition, Cisco Press, 2006.
3. Laura Chappell and Gerals combs, Wireshark Network Analysis, 1st Edition, 2010

MC2007: Android Programming

Teaching Scheme

Lectures: 3 hrs/week
Tutorials: 0
Total Credits: 3

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Description: This course introduces mobile application development for the Android platform. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. Students will learn skills for creating and deploying Android applications, with particular emphasis on topics including software architecture, software process, usability, and deployment.

Course Educational Objectives:

- Build own Android apps
- Explain the differences between Android™ and other mobile development environments
- Understand how Android™ applications work, their life cycle, manifest, Intents, and using external resources
- Design and develop useful Android™ applications with compelling user interfaces by using, extending, and creating your own layouts and Views and using Menus.
- Take advantage of Android's APIs for data storage, retrieval, user preferences, files, databases, and content providers
- Tap into location-based services, geocoder, compass sensors, and create rich map-based applications
- Utilize the power of background services, threads, and notifications.
- Use Android's communication APIs for SMS, telephony, network management, and internet resources (HTTP).
- Secure, tune, package, and deploy Android™ applications

Course Content:

1. Introduction To Mobile App: Why we Need Mobile Apps, Different Kinds of Mobile Apps, Briefly about Android: History Behind Android Development, What is Android? Pre-requisites to learn Android, Brief Discussion on Java Programming,

Android Architecture: Overview of Android Stack, Android Feature, Introduction to OS layers, Versions of OS, Linux Kernel, Libraries, Android Runtime, Application Framework, Dalvik VM, Configuring Android Stack, Setting up Android Studio, Working with Android Studio

2. Creating Android Project: Debugging Application through DDMS, setting up environment, AVD Creation, Executing Project on Android Screen, **Android Components** Activities, Services, Broadcast Receivers, Content Providers

Hello World App: Creating your first project, The manifest file, Layout, resource folder, Running your app on Emulator, Data Storage types

3. Building UI with Activities: Activities, Views, layouts and Common UI Components, Creating UI through code and XML, Activity lifecycle, IntentsCommunicating data among Activities**Advanced UI:** Selection components (GridView, ListView, Spinner), Adapters, Custom Adapters, Complex UI components, Building UI for performance, Menus, Creating custom and compound Views

4. Notifications: Toast, Custom Toast, Dialogs, Status bar NotificationsStyles And Themes, Multimedia, Using camera, Telephony services, working with Wifi

5. Working with SQLite : Location Based services using Google Maps, Web services and web view, working with Telephony services, Bluetooth

LABORATORY COURSES

MC2008: LAB[Core Java]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

Minimum of 10 Programs should be completed which will be based on the subject and record for the same shall be submitted

Suggestive List of Programs –

1. Write a program to input an array of 10 elements and sort it with any sorting method
2. Write a program to add two matrices by using different methods, classes
3. Write a program to convert a digit into its word format using different method.
4. Write a program to collect the basic information of flowers. Define base class, derived class with different properties; inherit the basic properties from base class. Display the properties of flowers.
5. Write a program to collect the information about student, write method for validation in base class. Input faculty & marks of student with validation in derived class and in an interface, find the result of the student. Display the result of the student.
6. Create a package contains addition, geometric mean, and harmonic motion of array elements and use it in your program.
7. Write a program to throw exception and for throwing our own exception using try, catch and finally statement.
8. Write a program to implement single thread and multiple threads in single program. Do the operations on thread. Also create runnable interface.
9. To study and implement Applets with Swings.
10. To study and implement JDBC classes in java.
11. Create a simple applet for drawing an ellipse, rectangle, menu etc. & Run in HTML
12. Design a Employee Registration Form using Frame.
12. Write a program to create I/O file operations

Practical Examination will consist of Performance and Viva-voice Examination The assessment will be based on the following–

1. Performance in the practical examination
2. Record of programs submitted by the candidate.

MC2009:LAB[ADBMS]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

Minimum of 8 Programs should be completed which will be based on the subject and record for the same shall be submitted.

Suggestive List of Programs –

- 1) Installation of oracle server and client in the lab.
- 2) Perform practically DDL, DCL and DML SQL commands.
- 3) Write SQL queries using
 - Joins
 - Subqueries
- 3) Create/Insert/Delete Varrays and nested tables
- 4) A sample application using OR features: The practical should be based on the ORDBMS features of Oracle
- 5) Perform practically backup and recovery procedures.
- 6) Create simple Java server page and perform validations.
- 7) Connect JSP and Java Beans. Take any live example to perform operation.
- 8) Using JDBC connect Oracle database

Practical Examination will consist of Performance and Viva-voice Examination The assessment will be based on the following –

1. Performance in the practical examination
2. Record of programs submitted by the candidate.

MC2010:Seminar

Teaching Scheme

Practical : 2 / week

Total Credits: 1

Examination Scheme

Term Work : 25

Practical Exam : 25

The seminar will consist of a typewritten report covering the topic selected for the seminar. The candidate shall deliver seminar on the topic, which will be judged internally in the department by two examiners and the marks will be given accordingly.

Practical Examination will consist of Performance and Viva-voice Examination

The assessment will be based on the following –

1. Performance in the practical examination.
2. Record of programs submitted by the candidate.

MC2011: LAB[Ele : Image Processing]

Teaching Scheme

Practical : 2 / week

Total Credits: 1

Examination Scheme

Term Work : 25

Practical Exam : 25

Suggestive List of Programs

Biometrics

1. Fingerprint Image preprocessing
2. Image enhancement, binarization, segmentation
3. Minutiae detection for fingerprint image
4. Fingerprint recognition
5. Face image preprocessing
6. Computing eigenface
7. Face recognition with nearest neighbor method
8. Face recognition with neural network

MC2012: LAB[Ele : Network Analysis And Management]

Teaching Scheme

Practical : 2 / week

Total Credits: 1

Examination Scheme

Term Work : 25

Practical Exam : 25

Suggestive list of Practicals

1. Connecting to a Router.
2. Introduction to the basic user interface
3. Introduction to the basic show commands.
4. Cisco Discovery Protocol.
5. Banner message of the day and Copy Command.
6. Introduction to the Interface configuration.
7. Introduction to Internet protocol and Address Resolution Protocol.
8. Creating a host table.
9. Static Routers and Routing Information protocol.
10. Troubleshooting routing information protocol.
11. Saving Router Configuration.
12. Loading Router Configuration.
13. Copying and Pasting Configuration.
14. Basic Switch Commands.
15. VLAN and VLAN Trunking protocol.

MC2013: LAB[Ele: Android Programming]

Teaching Scheme

Practical : 2 / week

Total Credits: 1

Examination Scheme

Term Work : 25

Practical Exam : 25

List of Suggestive experiments:

1. Installing Android studio and creating Hello World Program
2. Creating various types of UI Layout in android
3. Creating simple activities and navigate using intent
4. Creating notifications in android
5. Using Camera in android
6. Using telephony services in android
7. Working with location based services
8. Working with SQLite in android
9. Working with Firebase and Web View
10. Mini Project

SEMESTER IV

MC2014: Advanced Java

Teaching Scheme

Lectures: 3 hrs/week

Tutorials: 1

Total Credits: 4

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

1. Describe Collection Framework and introduce Eclipse IDE
2. Describe JDBC and Database Operations
3. Enable Students on how to use Servlets & JSP
4. Demonstrate MVC Architecture and Struts
5. Demonstrate ORM Mapping and Hibernate

Course Outcomes Expected:

At the end of the course the student will be able to

1. Develop and use Eclipse to create new project
2. Develop Database & its related Operations using Servlet.
3. Convert their project to layered MVC Architecture
4. Implement the advanced environment using Hibernate,Struts,Spring in their Application.
5. Develop and Test their projects in maven,Junit,JAXB.
- 6.

1. Introduction to Networking and RMI

Basics Of Networking, Overview Of The OSI Model, Socket Programming, Client Sockets And ServerSocket, Multicast Sockets **RMI**: Introduction To Distributed Computing, RPC, Introduction To RMI, Stubs And Skeletons, The Process Of Creating A Simple RMI Application

2.ServletsIntroduction To Web Application Development, Introduction of a 2 & 3 Tier Architecture, Server Side Programming, Introduction To Servlets, Comparing Servlets With CGI, Servlet Lifecycle, Servlet With Html, Server Side Includes, Servlet Chaining, HTTP Tunneling, Session Management, Servlets With JDBC, Inter Servlet Communication, Deployment Descriptor (web.XML), Servlet Context &Config Objects, ,Event Handling in Servlet, Jasper Report generation & Calling Using Servlet.

3.Java Server Page and MVC Architecture

Introduction,Difference between Servlet &JSP,Basic Tags (Scriptlet,expression,directives ,declaration), Basic Objects (out, session, request, application), Action tags(forward,include etc.),Java Server Tag Library.

Introduction to **MVC**, Role of MVC in Servlet and JSP architecture.

4. Hibernate, Struts and Spring

Introduction, difference between hibernate &JDBC, Architecture of hibernate & ORM understanding, Steps to configure hibernate & create sample program, Introduction to HQL & work with database,**Struct** :Introduction &History, Struts with Hibernate, Struts with Spring, Struts with

JDBC, **Spring** :Spring Core Module, Spring J2EE module, Spring ORM, Spring JDBC, Spring AOP(Aspect Oriented Module), Spring Web MVC module

5. Maven project and Web services

Maven :What is Maven, ANT Vs Maven, Install Maven, Maven Repository, Local Repository, Central Repository, Remote Repository, Maven Pom.xml, Maven Example, Maven Web App, Maven Plugin

Web service :WS Components, SOAP Web Service, RESTful Web Service, SOAP vs RESTSOA, Java Web Services

6. J-unit Testing: Types of JunitTesting, Assert Classes

JAXB : What is JAXB ,features of JAXB, Object to XML, XML to Object

Text/Reference Books:

1. Core Java Part 2 Advanced Features – Sun Microsystems press
2. J2EE™ Tutorial, The, 2nd Edition By Eric Armstrong, Jennifer Ball, Stephanie Bodoff, Stephanie Bodoff, Stephanie Bodoff, Debbie Carson, Ian Evans, Dale Green, Kim Haase, Eric Jendrock. Published by Addison Wesley
3. Java Design Patterns: A Tutorial by James W. Cooper Addison Wesley Pearson Press
4. Struts in Action – Ted Husted
5. Java Web service: Up and Running – By Martin Kalin

MC2015: Distributed Databases

Teaching Scheme

Lectures: 3 hrs/week
Tutorials: 1
Total Credits: 4

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Objectives:

- Enhanced the knowledge in the area of Distributed Database system.
- Comprehend the Distributed query processing
- The subject explores the ideas of Transaction management and concurrency control.
- Know the parallel database system architecture.
- Become conscious about current trends.

Course Outcomes:

At the end of the course, the student will be able to

- CO1:** Aware of fundamentals of Distributed Database systems.
- CO2:** Use the different techniques of Distributed query processing.
- CO3:** Set the rules over management of transaction and concurrency control.
- CO4:** Familiar with parallel database system architecture.
- CO5:** Apprehend Machine Learning Algorithms.

1.Introductory concepts and design of Distributed Database Systems [8]

Distributed DBMS architecture, Distributed database design, Alternative design strategies, Design Issues, Data Fragmentation, Replication, and allocation techniques for DDBMS, Semantic data control: View management, Data security; client server architecture.

2.Distributed query processing and Data Replication [8]

Overview of query processing: Query processing problems, Objectives, Complexity, Characterization query processing, Layers of query processing, Optimization of distributed queries: Join ordering in fragment queries, Semi join; Data Replication: Consistency of Replicated Databases, Update Management Strategies, Replication Protocols.

3.Transaction Management and Concurrency Control [8]

One-tier and two-tier models; three-tier model, Introduction to transaction management: Defining a transaction, properties of transaction, types transaction, transaction monitor; services provided by a transaction monitor; Deadlock Management, RELAXED Concurrency control.

4.Parallel database systems and Database Interoperability [8]

Parallel database systems: Database servers, parallel- architectures; parallel DBMS techniques: Data Placement, query parallelism, parallel data processing; Database Interoperability: Database Integration, Query Processing, Transaction management, Object orientation and Interoperability.

5.Current Trends [8]

Introduction to Big Data and hadoop; Introduction: Why Look Beyond Hadoop Map-Reduce?, Berkeley Data Analytics Stack (BDAS); Realizing Machine Learning Algorithms with Spark. Case Study: a survey of Data Center : Typical components, Networking, Fire safety, Backup provision.

TEXT BOOKS

1. M. Tamer Ozsü, M. and Valduriez, P. - Principles of Distributed Database Systems, (2nd Edition) Prentice Hall International Inc. 1999 ISBN 0-13-607938-5
2. Vijay Srinivas Agneeswaran - Big Data Analytics Beyond Hadoop *Pearson Education, Inc.*

REFERENCE BOOK:

3. Orfali, R., Harkey Dan and Edwards, J. The essential Distributed Objects-Survival guide. John Wiley & Sons, Inc. 1996 ISBN 0-471-12993-3

MC2016: Software Testing Techniques

Teaching Scheme

Lectures: 3 hrs/week
Tutorials: 0
Total Credits: 3

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Educational Objectives:

- 1) Understand the basics of software testing
- 2) Study different strategies for software testing
- 3) To stress the need of testing and conduct testing at different levels
- 4) To identify the issues in testing management

Course Outcomes Expected:

- 1) To make students understand the principles of software testing
- 2) Conduct testing at different levels
- 3) Bring out the efficient ways to conduct testing activity

Contents:

1. Introduction

Software testing background, Software development process- product components, software project staff, software development lifecycle model, Realities of software testing – Testing Axioms, Software testing terms and definitions.

2. Fundamentals of Testing

Examining the specification- Black-Box and White-Box Testing, Static and Dynamic Testing, Static Black-Box Testing: Testing the Specification, Performing a High-Level Review of the Specification, Low-Level Specification Test Techniques, Testing the specification with blinders on - Test-to-Pass and Test-to-Fail, Equivalence Partitioning, Data testing, State testing, Other Black-Box Test Techniques, Examining the code- Static White-Box Testing: Examining the Design and Code , Formal Reviews, Coding Standards and Guidelines, Generic Code Review Checklist, Testing the software with X ray glasses - Dynamic White-Box Testing, Dynamic White-Box Testing Versus Debugging, Testing the Pieces- Unit and Integration Testing, Data Coverage, Code Coverage

3. Types of Testing –I

Configuration Testing, Compatibility Testing, Foreign Language Testing, Usability testing, Testing the Documentation

4. Types of Testing –II

Testing software security, Website testing, Automated Testing and Test Tools. Bug Bashes and Beta Testing.

5. Test Planning and Management

Planning Your Test Effort, Writing and Tracking Test Cases, Reporting What You Find.
Measuring the success- Using the Information in the Bug Tracking Database,
Fundamental Metrics for Software, Testing. Software Quality Assurance

Test Book-

1. Software Testing, 2/e, Ron Patton ,SAMS publication

Reference Books-

2. Software Testing: Principles and Practices, SrinivasanDesikan, Pearson Education
3. A Practitioner's Guide to Software Test Design, Lee Copeland, Artech House
4. The Art of Software Testing, 2nd edition, Glenford Myers, John Wiley & Sons
5. Software Testing Techniques, 2nd edition, Boris Beizer, DreamTech Press

MC2017 : Cloud Computing

Teaching Scheme

Lectures: 3hrs/week
Tutorials: 0
Total Credits: 3

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Educational Objectives:

1. To provide students with the fundamentals and essentials of Cloud Computing.
2. Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.
3. Understand the importance of protocols and standards in computing.

Course Outcomes Expected:

At the end of the course the student will be able to

1. Identify the appropriate cloud services for a given application.
2. Assess the comparative advantages and disadvantages of Virtualization technology.
3. Analyze authentication, confidentiality and privacy issues in cloud computing.
4. Identify security implications in cloud computing.
5. Understand the importance of protocols and standards in management for cloud services.

Contents:

1. Introduction to Cloud Computing :

Defining Cloud computing, Characteristics, Components, deployment model, service model, Applications, Benefits of cloud computing, Limitations of cloud computing. Overview of Grid Computing Technology, Grid Computing, Grid vs Cloud Computing.

2. Cloud architecture, Services and Applications Exploring cloud computing stack

:Composability, Infrastructure, Platforms, Virtual Appliances, Communication Protocols, Applications, Defining Infrastructure as a Service (IaaS), Defining Software as a Service (SaaS), Defining Platform as a Service (PaaS), Defining Identity as a Service (IDaaS), Defining Compliance as a Service (CaaS).

3. Cloud Infrastructure and Virtualization Hardware and Infrastructure :

Clients, Security, Network and Services., use of Virtualization technology, Load Balancing and Virtualization, virtualization benefits, Hypervisors, porting application, Defining cloud capacity by defining baselines and Metrics.

4. Exploring cloud services Software as a Service :

Overview, advantages, limits, virtualization benefits, examples. Platform as a Service – overview, advantages and functionalities, PaaS application frameworks – Drupal, Long Jump. Case study – Google Apps and Web Services.

5. Cloud Administration and Security Management :

Management responsibilities, lifecycle management, cloud management products, Cloud management standards. Cloud security, data security, Identity and presence protocol standards,

Availability management in SaaS, IaaS, PaaS, Access Control, Security Vulnerability, Patch and Configuration Management, Security as a Service of cloud, Future of Security in Cloud computing.

Text Books :

1. Barrie Sosinsky, “Cloud Computing Bible”, Wiley India Edition. 2. Anthony Velte, Toby Velte, Robert Elsenpeter, “Cloud Computing – A Practical Approach”, Tata McGraw-Hill Edition.

Reference Books –

1. John W. Rittinghouse, James F. Ransome, “cloud computing: implementation management and security” CRC Press.
2. GautamShroff, “Enterprise Cloud Computing: Technology, Architecture, Applications”, Cambridge University Press.
3. Christian Baun, Marcel Kunze, Jens Nimis, Stefan Tai, “Cloud Computing: WebBased Dynamic IT Services”, Springer.

MC2018: Data Mining And Warehousing

Teaching Scheme

Lectures: 4hrs/week

Tutorials: 0

Total Credits: 4

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Educational Objectives:

1. To introduce students to the basic concepts and techniques of Data Mining
2. To develop Skills of using recent data mining software for solving practical problems
3. To gain experience of doing independent study and research.
4. Explain the significance of exploratory data analysis.

Course Outcomes Expected:

After completion of this course student will be able to

CO1: Apply EDA in a case study

CO2: Apply basic machine learning algorithms.

CO3: Identify approaches used for feature selection

CO4: Create effective visualization of given data

CO5: Work effectively in teams of data science projects.

Contents:

1. Introduction to Data Mining

- What is data mining?
- Related technologies - Machine Learning, DBMS, OLAP, Statistics
- Data Mining Goals
- Stages of the Data Mining Process
- Data Mining Techniques
- Knowledge Representation Methods
- Applications
- Example: weather data

2. Data Warehousing and Business Intelligence Management

- Business intelligence
- Data mart
- Data mining
- Data movement (extract, transform and load)
- Data warehousing
- Example: loan data set

3. Data mining algorithms Association & Classification

1. Data mining algorithms: Association rules
 - Motivation and terminology
 - Example: mining weather data
 - Basic idea: item sets
 - Generating item sets and rules efficiently
 - Correlation analysis

- Experiments with Weka - mining association rules
- 2. Data mining algorithms: Classification
 - Basic learning/mining tasks
 - Inferring rudimentary rules: 1R algorithm
 - Decision trees
 - Covering rules
 - Experiments with Weka - decision trees, rules

4. Data mining algorithms Prediction & Clustering

- 3. Data mining algorithms: Prediction
 - The prediction task
 - Statistical (Bayesian) classification
 - Bayesian networks
 - Instance-based methods (nearest neighbor)
 - Linear models
 - Experiments with Weka – Prediction
- 4. Clustering
 - Basic issues in clustering
 - First conceptual clustering system: Cluster/2
 - Partitioning methods: k-means, expectation maximization (EM)
 - Hierarchical methods: distance-based agglomerative and divisible clustering
 - Conceptual clustering: Cobweb
 - Experiments with Weka - k-means, EM, Cobweb

5. Advanced techniques, Data Mining software and applications

- Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing).
- Bayesian approach to classifying text
- Web mining: classifying web pages, extracting knowledge from the web
- Data Mining software and applications
-

TEXT BOOKS:

Required reading: Ian H. Witten and Eibe Frank, *Data Mining: Practical Machine Learning Tools and Techniques (Second Edition)*, Morgan Kaufmann, 2005, ISBN: 0-12-088407-0.

1. Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann, second edition
2. Margaret Dunham, "Data Mining - Introductory and advanced topics", Pearson Education
3. Antony Scime, Web mining: applications and techniques
4. Galit Shmueli, Nitin R. Patel, Peter C. Bruce, "Data Mining for Business Intelligence", Wiley India Edition
5. Michael J.A. Berry, Gordon S. Linoff, "Mastering Data Mining", Wiley Student Edition

REFERENCE BOOKS: 1. Robert Nisbet, John Elder, Gary Miner, Handbook of Statistical Analysis and Data Mining Applications, Elsevier, 2009. Soumen Chakrabarti, Mining the Web: Discovering Knowledge from Hypertext Data

MC2019 : Python Programming

Teaching Scheme

Lectures: 4hrs/week
Tutorials: 0
Total Credits: 4

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Description:

Python is a language with a simple syntax, and a powerful set of libraries. It is an interpreted language, with a rich programming environment, including a robust debugger and profiler. While it is easy for beginners to learn, it is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming, and graphical user interface-driven applications. The examples and problems used in this course are drawn from diverse areas such as text processing, simple graphics creation and image manipulation, HTML and web programming, and genomics.

Contents:

1.

Introduction:

History, Features, Setting up and Installation, Working with Python, Understanding Python Variables and Operators, Understanding python blocks, Understanding Python Data Types, Working with Operators

2. Conditional blocks using if, else and elif, Simple for loops in python, For loop using ranges, string, list and dictionaries, Use of while loops in python, Loop manipulation using pass, continue, break and else, Programming using Python conditional and loops block

3. Concept of class object and instances, Constructor, class, attributes and destructors, Real time use of class in live projects, Inheritance , overlapping and overloading operators, Adding and retrieving dynamic attributes of classes, Programming using OOps support, Organizing python codes using functions, Organizing python projects into modules, Importing own module as well as external modules, Understanding Packages, Powerful Lamda function in python

4. Understanding string In build methods, List manipulation using in build methods, Dictionary manipulation, Programming using string,list and dictionary in build functions, Avoiding code break using exception handling, Safe guarding file operation using exception handling, Handling and helping developer with error code, Programming using Exception handling

5. Reading config files in python Writing log files in python, Understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Manipulating file pointer using seek Programming using file operations, SQL Database connection using python Creating and searching tables, Reading and storing config information on Database, Programming using database connections

MC2020: Mobile Computing

Teaching Scheme

Lectures: 4hrs/week

Tutorials: 0

Total Credits: 4

Examination Scheme

Test: 20

Assignment: 20

End Semester: 60

Course Objectives:

- To impart the knowledge to the students so that they will be able to
- To learn about the concepts and principles of mobile computing;
- To explore both theoretical and practical issues of mobile computing;
- To develop skills of finding solutions and building software for mobile computing applications.

Course Outcomes :

After completing this course, students will able to:

CO1: Understand and identify the GSM, GPRS and Bluetooth software model for mobile computing.

CO2:The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.

CO3:Understanding of the characteristics and limitations of mobile hardware devices including their user-interface modalities

CO4:Analyze QoS over wire and wireless channels

CO5:Able to promote the awareness of the life-long learning,business ethics, professional ethics and currentmarketing scenarios.

Contents:

1.Introduction to Mobile Communications and Computing:

Introduction to MC, novel applications, limitations, and architecture.GSM : Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

2.(Wireless) Medium Access Control:

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunnelling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

3.Mobile Transport Layer :

Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

4.Database Issues:

Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

5. Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs. Protocols and Tools: Wireless Application Protocol-WAP.(Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management).

TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4,7,9,10,11), second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

REFERENCES :

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.

MC2021 : Pattern Recognition

Teaching Scheme

Lectures: 4hrs/week
Tutorials: 0
Total Credits:4

Examination Scheme

Test: 20
Assignment: 20
End Semester: 60

Course Outcomes Expected:

- Understand the concept of patterns and the basic approach for Pattern Recognition system Design.
- Understand the principles of Bayesian Decision Theory and apply it to simple probabilistic models.
- Apply maximum likelihood and Bayesian parameter estimation to various probabilistic models.
- Understand discrete and continuous hidden Markov models.

1. Basics of Probability, Random Processes and Linear Algebra (recap): Probability: independence of events, conditional and joint probability, Bayes theorem Random Processes: Stationary and non-stationary processes, Expectation, Autocorrelation, Cross-Correlation, spectra.

2. Bayes Decision Theory : Minimum-error-rate classification. Classifiers, Discriminant functions, Decision surfaces. Normal density and discriminant functions. Discrete features.

3. Parameter Estimation Methods : Maximum-Likelihood estimation :Gaussian case. Maximum a Posteriori estimation. Bayesian estimation: Gaussian case. Unsupervised learning and clustering - Criterion functions for clustering. Algorithms for clustering: K-Means, Hierarchical and other methods. Cluster validation. Gaussian mixture models, Expectation-Maximization method for parameter estimation. Maximum entropy estimation. Sequential Pattern Recognition. Hidden Markov Models (HMMs). Discrete HMMs. Continuous HMMs. Nonparametric techniques for density estimation. Parzen-window method. K-Nearest Neighbour method.

Linear discriminant functions : Gradient descent procedures, Perceptron, Support vector machines - a brief introduction.

4. Dimensionality reduction: Principal component analysis - it relationship to eigen analysis. Fisher discriminant analysis - Generalised eigen analysis. Eigen vectors/Singular vectors as dictionaries. Factor Analysis, Total variability space - a dictionary learning methods. Non negative matrix factorisation - a dictionary learning method.

5. Artificial neural networks: Multilayer perceptron - feedforward neural network. A brief introduction to deep neural networks, convolutional neural networks, recurrent neural networks.

Text Books:

- R.O.Duda, P.E.Hart and D.G.Stork, Pattern Classification, John Wiley, 2001
- S.Theodoridis and K.Koutroumbas, Pattern Recognition, 4th Ed., Academic Press, 2009
- C.M.Bishop, Pattern Recognition and Machine Learning, Springer, 2006

MC2022: LAB[Advanced Java]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

Minimum of 10 Programs should be completed which will be based on the subject and record for the same shall be submitted

Suggestive List of Programs –

- 1) W.A.P. for creating mini chat application using socket programming.
- 2) W.A.P. for Addition and Subtraction using concept of RMI programming.
- 3) WAP to implement CRUD operation in JDBC.
- 4) Create Exam Registration Form using JDBC Connectivity.
- 5) W.A.P. for creating Edit menu for Notepad using Frame.
- 6) WAP for creating simple servlet with JDBC.
- 7) Create Employee information Form using JSP
- 8) W.A.P for implementing concept of MVC Architecture.
- 9) W.A.P for implementing concept of Hibernate,Stuct, Spring.
- 10) W.A.P for implementing concept of Maven Project.
- 11) W.A.P for implementing concept of Web Service.
- 12) W.A.P for implementing concept of Junit Testing.
- 13) W.A.P for implementing concept of JAXB.

MC2023 : LAB[Software Testing Techniques]

Teaching Scheme

Practical : 2 / week

Total Credits: 1

Examination Scheme

Term Work : 25

Practical Exam : 25

List of Experiments:

Minimum of 8 Programs should be completed which will be based on the subject and record for the same shall be submitted

Suggestive List of Programs –

1. Study of testing tools
2. Test case design for functional testing
3. Test case design for loop testing
4. Test case design for synchronization
5. Test case design in batch mode
6. Testing of GUI application
7. Testing of object oriented application
8. Testing with Data Driver Wizard

Practical Examination will consist of Performance and Viva-voice Examination

The assessment will be based on the following –

1. Performance in the practical examination
2. Record of programs submitted by the candidate.

MC2024: LAB[Cloud Computing]

Teaching Scheme

Practical : 2 / week

Total Credits: 1

Examination Scheme

Term Work : 25

Practical Exam : 25

Sr. No	Title of Experiment
1	Introduction to cloud computing.
2	Installing Ubuntu (server edition) using virtual box, and study virtualization
3	Writing Sample Applications on Cloud using Google App Engine.
4	Implementation of SOAP Web services in C#/JAVA Applications.
5	Understanding Software as a Service: Sales Force
6	Understanding Private Clouds: OpenStack, Eucalyptus.
7	Setting up and using an instance on public IaaS cloud, using Amazon AWS
8	Exploring GitHub to learn features such as a. How to create repositories on GitHub. b. How source code can be uploaded/downloaded from repositories. c. Making code commits in repositories. d. GitHub issue tracking features. 4
9	To Study Cloud Security challenges.

MC2025: LAB[Ele : Data Mining And Warehousing]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

1. Evolution of data management technologies, introduction to Data Warehousing & necessity of data preprocessing .
2. Study of WEKA Tool for ETL and create arff file.
3. Implement of basic Data preprocessing operations in Weka tools
4. Implementation of classification rule process on WEKA data-set using j48algorithm.
5. Implement clustering techniques in Weka tools
6. Write a program of Apriori algorithm.
7. Implementation of K-Means algorithm
8. Implementation of OLAP operations.
9. A case study of Business Intelligence in Government sector/social Networking/Business.

Write any one case study from the following list.

10.
 - A) Dataware housing & Analytics infrastructure at facebook
 - B) Spatio-Temporal Datawarehousing
 - C) GFINDER data warehousing
 - D) Mobility Data Warehousing and Mining
 - E) Data Warehousing for rough Web Caching

Required software

[Weka 3](#) : Data Mining System with Free Open Source Machine Learning Software in Java.

Available at <http://www.cs.waikato.ac.nz/~ml/weka/index.html>

MC2026: LAB[Ele : Python Programming]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

List of Suggestive experiments:

1. Introduction to Python and its Installation
2. Create a simple hello world program using Python
3. Working with variables and data types in Python
4. Working with conditional and looping operators
5. Implementing OOPS concept with Python
6. Using Lambda Function in Python
7. Implementing Exception Handling in Python
8. Using File Handling in Python
9. Working with Database using Python
10. Mini Project

MC2027: LAB[Ele : Mobile Computing]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

Minimum of 8 Programs should be completed which will be based on the subject and record for the same shall be submitted.

Suggestive List of Programs –

Part A

- 1) Write a program to format a text.
- 2) Write a program to display data in tabular format.
- 3) Write a program for user input and navigation between cards.
- 4) Write a program to handle different events.
- 5) Write a program to convert currency.
- 6) Write a program to perform validation using WML script.
- 7) Write a program using phone.com.
- 8) Write a program to connect ASP and WML.

Part B : Android Programming

- 1) Installing and developing environment with Eclipse and creating Hello World Application
- 2) Using Standard Controls like Textbox, Button, Image etc to develop a form
- 3) Using Event Listeners and Intents to navigate amongst activities.
- 4) Using styles and themes for UI Designing
- 5) Creating Menu Controls in Android
- 6) Creating Various Dialog boxes

Practical Examination will consist of Performance and Viva-voice Examination The assessment will be based on the following –

1. Performance in the practical examination
2. Record of programs submitted by the candidate.

MC2028: LAB[Ele : Pattern Recognition]

Teaching Scheme

Practical : 4 / week

Total Credits: 2

Examination Scheme

Term Work : 25

Practical Exam : 50

Practical List :

1. Feature extraction with PCA
2. Feature extraction with syntactic method
3. Study of different classifiers
4. Classification with Bayes' method
5. Object recognition with supervised learning algorithm
6. Object recognition with unsupervised method
7. Object detection in biomedical image
8. Object detection in videos