

**SARDAR PATEL UNIVERSITY
VALLABH VIDYANAGAR**



SYLLABUS EFFECTIVE FROM: 2018-19

(Under Choice Based Credit Scheme)

MSC- Information Technology

(પીજી બીસ ટી. ૦૩/૦૫/૨૦૧૭)

Semester – III

Java Programming

COURSE NO: PS03CINT21

(Total Marks: 100)

COURSE CONTENT:

1. Introduction to Java and its Basic Concepts

- The Java programming language: history, evolution, features
- Introduction to the Java programming environment, JDK, JRE
- An anatomy of a Java program
- Data types, wrapper classes, automatic boxing and unboxing
- Inheritance, polymorphism, Interfaces
- Input-output in Java
- Exception handling
- String handling

2. Graphical Programming - I

- An introduction to graphics in Java
- Introduction to the Abstract Window Toolkit (AWT)
- Overview of Java Applets
- The Swing library
- Writing graphical programs using Swing
- Using various Swing components

3. Graphical Programming – II and JDBC

- Managing layout using Swing
- Event handling using Swing
- Introduction to JDBC
- Different types of JDBC drivers
- Programming database applications using JDBC

4. Extended Java Programming

- Multithreading
- Introduction to serialization
- Introduction to java.util package and important members from it
- Introduction to Servlet
- Introduction to Java API

Reference Books:

1. Schildt H. : The Complete Reference Java 2, 5th Edition, McGraw-Hill / Osborne, 2002
2. Daniel Joshi and Paul Vorobeiu: The Java 1.1 Programmer – Comdex Times
3. C. Thomas: Introduction to Object Oriented Programming with Java - TMH
4. Naughton: The Java Hand Book - TMH

Data Communication and Networking

COURSE NO: PS03CINT22

(Total Marks: 100)

COURSE CONTENT:

Unit - 1: Network Communication

- Reference models (OSI and TCP/IP) & their comparison
- Network devices (Repeater, Bridge, Router, Gateway)
- Network Management

Unit - 2: Internet Protocol

- Introduction to TCP/IP (IPV4, IPV6), HTTP, FTP, SMTP, MIME, TELNET, UDP
- IP header, IP routing, subnet addressing, subnet mask
- TCP Service model, segment header, connection management, transmission policy, congestion control

Unit - 3: Wireless Technology

- Introduction and architecture
- Satellite Networks
- Digital Cellular Radio
- Bluetooth
- SMS
- WAP: Architecture and features, Understanding WAP Browser and server
- WML
- Understanding tags: Creating WML scripts, execution using WAP browser

Unit - 4: Distributed Computing

- Introduction to distributed computing environment.
- COM - Basic fundamentals, creating simple client and server
- DCOM: Architecture , reusability, scalability, performance, fault tolerance, Connection management, Concurrency management, security issues

Reference Books:

1. Andrew Tanenbaum: Computer Networks - PHI
2. R. Smith: Cryptography and Network Security Principles and Practice 2nd edition – PHI
3. Robert Orfali, Dan Harkey: Client/Server Programming with Java & Corba
4. Richard Grimes: Professional DCOM Programming – Wrox
5. Professional WAP - Pearson Education

Information Security

COURSE NO: PS03CINT23

(Total Marks: 100)

COURSE CONTENT:

Unit - 1: Understanding TCP/IP

- Network configuration and access files
- TCP/IP daemons, utilities and commands
- Audit trails- Unix logs, accounting and utilities, Windows audit trails
- Architecture for securing VPN
- IP Spoofing and sniffing – sniffing methods, sniffing results, sniffing prevention, ARP, ICMP and TCP Spoofing

Unit - 2: Firewalls

- Introduction to firewall
- Components and characteristics
- Types of firewall
- Building firewalls
- Brief idea of using network security reporting tools

Unit - 3: Encryption

- Techniques
- Cryptography
- Digital ID's, Certificates and Signatures
- Symmetric (secret key) Cryptography
- Asymmetric Cryptography
- Cryptanalysis
- SSL
- PGP (Pretty Good Privacy) Overview
- Using PGP, generating, distributing, signing public keys
- Keys and Key management
- Message Operations

Unit - 4: Operating System Security

- Windows server Overview
- Logon and authentication
- Intranet related features of Windows server
- Web Server IIS
- Proxy Server
- Configuring Services and ports in Windows server
- Unix Security

Reference Books:

1. Internet Security – Professional Reference, Techmedia
2. Maximum Security Author – Anonymous Techmedia

DISTRIBUTED APPLICATION DEVELOPMENT TECHNOLOGY

COURSE NO: PS03CINT24

(Total Marks: 100)

COURSE CONTENT:

Unit-1: Overview

- .Net Framework
- The ASP.NET Page structure
- ASP.NET Page Directives
- ASP.NET Page Events, Dealing with post back
- Web service architecture
- Creating Sample web service

Unit- 2: Web Server Controls

- Label, Literal, TextBox, Button, LinkButton, ImageButton, HyperLink, DropDownList
- ListBox, CheckBox, CheckBoxList, RadioButton, RadioButtonList, Calendar, AdRotator,
- Panel, Hidden Fields, File Upload, Login control
- **Validation Control:** Understanding Validation Control, Client/Server side Validation,
- Requiredfield validator, Comparevalidator, Rangevalidator, RegularExpression, Validationsummary,
- **Master Page:** Basic of Master Page, Coding of Master Page, Coding of content Page, Specifying Default Content in Master Page, Programmatically assigning master Page.
- **Website Navigation** : SiteMapPath, Menu, TreeView

Unit-3 DataBase Connectivity

- Using SQL DataSource Control, GridView, DetailView, Form View and List View
- Database management with ADO.NET: Common ADO.NET task, NameSpace, Connection, Command, DataReader, Parameter, DataList, ListView

Unit 4: Recent trends in web application

- Introduction of Silverlight,
 - Creating Standalone Silverlight project
 - Creating Simple Silverlight page
- Introduction to MVC
 - MVC architecture
 - Creating sample web application with MVC

Books:

1. Professional ASP.NET 4 in C# and VB. Bill Evjen Scott Hanselman, Devin Radar, Wrox
2. Pro Silverlight 4 in C#, Matthew MacDonald, Apress
3. Beginning ASP.NET 4 in C# 2010, Matthew MacDonald, Apress
4. Silverlight 4 Unleashed, Laurent Bugnion, Pearson.
5. Professional ASP.NET MVC 5, Wrox Publication
6. MSDN Library

Practical based on PS03CINT21 and PS03CINT24

COURSE NO: PS03CINT25

(Total Marks: 100)

COURSE CONTENT:

Practical are based on PS03CINT21 and PS03CINT24

Artificial Intelligence

COURSE NO: PS03EINT21

(Total Marks: 100)

COURSE CONTENT:

Unit 1: Introduction

- AI Problem Characteristics
- Introduction to AI as an specified area of advanced DSS
- Computer vision and perception
- Problem solving
- Machine Learning
- Robotics
- Searching in Problem space

Unit 2: Expert Systems

- Introduction
- Expert system shells
- Explanation
- Rule based system and Forward-Backward chaining

Unit 3: Knowledge acquisition, Representation and Engineering

- Approaches and issues in knowledge representation
- Network representation
- Structures: Semantic nets, Frames , Scripts
- Fuzzy logic and reasoning
- Fuzzy logic in Knowledge representation and reasoning

Unit 4: Natural language processing and Neural Networks

- Introduction
- Natural language processing
- Level and stages of Natural language analysis
- Fuzzy logic in NLP
- Basic of Neuroscience
- Types of Neural Networks
- Learning and self organizing Neural Networks
- Fuzziness in Neural Network
- Applications of Neural Network

Reference Books:

1. Elaine Rich and Kelvin Knight: Artificial Intelligence 2nd Edition - TMH
2. AWL, Eugene Charniak: Introduction to Artificial Intelligence - Drew McDermott
3. Morgan Kaufmann :Exploring Artificial Intelligence- Howard E. Shrobe
4. Carl Townsend :Introduction to Turbo Prolog - BPB
5. W.F.Clocks in and C.S. Mellish : Programming In Prolog 3rd Edition - Narosa Publication House
6. N.K.Bose , P.Liang :Neural Network Fundamentals with Graphs , Algorithm - McGraw Hill Publications

Data Mining & Data Warehousing

COURSE NO: PS03EINT22

(Total Marks: 100)

COURSE CONTENT:

Unit 1: Data Warehousing and Data Mining - Introduction

- Data warehouse introduction
- Characteristics of data warehouse
- Data warehouse delivery method
- Data mining introduction
- Data mining Vs Query tools
- Data Learning
- Benefits of data mining

Unit 2: Data Warehouse Architecture

- System Process
 - Process flow within an data warehouse
 - Extract and Load Process
 - Clean and Transform data
 - Backup and Archive Process
 - Query Management Process
- Process Architecture
 - Load and Warehouse Manager
 - Query Manager
 - Detailed and Summary Information
 - Metadata
 - Data Marting

Unit 3: Database Design – Logical

- Database Schema – Starflake
- Partitioning strategy
- Aggregations
- Data Marting
- Metadata
- System and Data Warehouse Process Manager

Unit 4: Database Design – H/W and Operational

- H/W Architecture
- Physical Layout
- Security
- Backup and Recovery
- Service Level Agreement
- Operating Data Warehouse

Reference Books:

1. S. Anahory & D. Murray: Data Warehousing in the real world – Addison Wesley
2. R. Kinball: Data Warehouse Toolkit – John Wiley & Sons
3. R. Kinball, L.Reeves : The Data Warehouse Lifecycle Toolkit – John Wiley & Sons
4. Pieter Adriaans, Dolf Zantinge, "Data Mining", Addison Wesley, 1996.

Multimedia and Computer Graphics

COURSE NO: PS03EINT23

w.e.f. June 2017
(Total Marks: 100)

COURSE CONTENT:

Unit – 1: MULTIMEDIA

- Introduction to Multimedia with its applications
- Multimedia hardware & software
- Introduction of digital medium and various facets of multimedia: digital audio, multimedia texts, Hypermedia Graphics
- Animation: two-dimensional and three-dimensional animation techniques and digital video and basic concept for color display
- Multimedia authoring, characteristics of authoring tools, authoring methodologies and multimedia programming

Unit – 2: OVERVIEW OF COMPUTER GRAPHICS SYSTEM

- Applications of Computer Graphics
- Introduction to Computer Graphics System
- Video display devices
- Raster Scan and random scan system
- Input and output devices
- Simple Raster Display System

Unit – 3: OUTPUT PRIMITIVES AND TWO DIMENSIONAL TRANSFORMATIONS

- Algorithms for output primitives (Line, Circle, Ellipse Generation)
- Boundary fill, flood fill, and soft fill algorithms
- Character generation – Bitmap and outline fonts
- Attributes of output primitives
- Basic 2-D transformations: Translation, Rotation, Scaling, Reflection and Shear
- Matrix representation of basic transformations and homogeneous coordinates

Unit – 4: CLIPPING AND THREE DIMENSIONAL CONCEPTS

- Three dimensional concepts – representations
- Windowing and Clipping
- Window to view port transformation, Point, Line, polygon and text clipping algorithms
- 3-D display methods: Parallel projection, Perspective projection
- 3D transformations (translation, rotation and scaling)
- 3D Viewing pipeline
- Visible surface detection methods

Main Reference Books:

1. S. Gokul: Multimedia Magic, Second Edition, BPB Publication, 2011
2. Hearn, D. and Pauline Baker, M., "Computer Graphics", Second Edition, Pearson Education, 2011.
3. Foley J. D., Van Dam A.: Fundamentals of Interactive Computer Graphics, Addison-Wesley. 1982

Other References:

1. Neuman, W.M., and Sproull, R.F., "Principle of Interactive Computer Graphics", McGraw Hill Book Co., 1979.
2. Rogus, D.F., "Procedure elements for Computer Graphics", Mc - Graw Hill Book Co., 1985.

Mobile Application Development using Android and WinDev

COURSE NO: PS03EINT23

(Total Marks: 100)

COURSE CONTENT:

Unit - 1: Introduction to Android

- Introduction to Android
- Standard development environment for Android applications
- Installing Android
- Creating Hello World and running application on Emulator
- Android Architectural Overview and Android Development Framework
- Introduction to Android tools
- Structure of Android application
- Components of Android

Unit - 2: Introduction to Activities and User Interface Design

- Introduction to activity
- Activity lifecycle phases
- Introducing Toast
- Introduction to Views and layouts and Common UI components
- Input and Selection components
- Adapters
- Menus and Dialogs
- Working with Intents
- Types of Resources

Unit – 3: Introduction to Content Provider and Sqlite Database

- File systems
- Persistent storage in Android
- Android databases
- Storing and retrieving data
- Content provider Classes

Unit – 4: Introduction to WinDev

- Introduction to WinDev Mobile versions
- Features of WinDev Mobile
- Types of mobile application in WinDev Mobile
- Introduction to WinDev Mobile IDE
- Using WinDev Mobile for Android application development

Reference Book:

1. Beginning Android Application Development By Wei-Meng Lee, Wiley Publishing, Inc, Wrox Programmer to Programmer
2. Online WinDev Documentation, <http://www.windev.com/pcsoft/documentations.html>