Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati.

SYLLABUS STRUCTURE OF SYBBA (C.A)

Bachelor of Business Administration (Computer Application)

Syllabus (CBCS Pattern) under Academic Autonomy for the year 2023-2024

Semester -III

Subject Code	Name of Subject	Credit
UBCA231	Java Programming	03
UBCA232A UBCA232B	Elective: PHP Node JS	03
UBCA233	Python Programming	03
UBCA234	Operating System Concepts	03
UBCA235	Business Statistics using R Programming	03
UBCA236	Computer Laboratory I[Based on UBCA231 & UBCA233]	02
UBCA237	Computer Laboratory II [Based on UBCA232 & UBCA235]	02
	Certificate Course	02
	Environmental Study (EVS)	02
	Total	23

Semester –IV

Subject Code	Name of Subject	Credit
UBCA241	Advanced Java Programming	03
UBCA242A UBCA242B	Elective: Advanced PHP React JS	03
UBCA243	Mathematical Foundation for Computer Applications	03
UBCA244	Software Testing and Automation	03
UBCA245	Networking	03
UBCA246	Computer Laboratory I [Based on UBCA241 & UBCA 244]	02
UBCA247	Computer Laboratory II[Based on UBCA242 & UBCA 245]	02
	Project	04
	Total	23

SYLLABUS (CBCS) FOR S.Y.BBA (C.A.) (w. e. from June, 2023)

Academic Year 2023-2024

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code : UBCA241   Title of Paper: Advanced Java Programming

Credit: 3   No. of. Lectures: 48

A] Learning Objectives:

1. To learn the advanced concepts of Java Programming.

2. To learn to design game-based applications using Graphics, Animations, andMultithreading.

3. To learn to design and develop web applications.

4. To understand how to use programming in day-to-day applications.

5. To understand network programming.

B] Learning Outcomes:

A student should be able to

1. Learn to access database using Java Data Base Connectivity in Java programs.

2. Learn to use an Applet for internet programming.

3. Develop dynamic webpages using Servlets and JSP.

4. Develop client/server applications and TCP/IP socket programming.

Topics/Content

Unit 1:   JDBC   **(08L)**

      1.1   The Design of JDBC

      1.2   Basic JDBC Program Concept

      1.3   Drivers

      1.4   Architecture of JDBC

      1.5   Making the Connection, Statement, Result Set,Prepared

            Statement, Callable Statement

      1.6   Executing SQL Commands

      1.7   Executing Queries

Unit 2:   Multithreading   **(08L)**

    2.1   Threading Basics

    2.2   Life Cycle of a Thread

    2.3   Creating Threads

    2.4   Priorities and Synchronization

    2.5   Inter Thread Communication

    2.6   Runnable Interface

Unit 3:   Servlet   **(08L)**

    3.1   Introduction

    3.2   How It Differs from CGI

    3.3   Types of Servlets

    3.4   The Life Cycle of a Servlet

    3.5   Execution Process of Servlet Application

    3.6   Session Tracking

    3.7   Cookie Class

    3.8   Servlet- JDBC

Unit 4:   JSP   **(06L)**

    4.1   Introduction to JSP

    4.2   The Life Cycle of a JSP

    4.3   Components of JSP Directives, Tags, Scripting

           Elements

    4.4   Execution process of JSP Application

    4.5   Building a simple application using JSP

    4.6   JSP with Database

Unit 5:   Networking   **(08L)**

    5.1   The java.net package

    5.2   Connection-Oriented Transmission – Stream Socket Class

    5.3   Creating a Socket to a Remote Host on a Port (Creating

           TCP Client and Server)

    5.4   Simple Socket Program Example

Unit 6:   Spring & Hibernate   (10L)

Spring:

6.1   Introduction

6.2   Applications and Benefits of spring

6.3   Architecture and Environment Setup

6.4   Hello World Example

6.5   Core Spring- IoC Containers, Spring Bean Definition,
       Scope, Lifecycle

Hibernate

6.6   Architecture and Environment

6.7   Configuration, Sessions, Persistent Class

6.8   Mapping Files, Mapping Types

6.9   Examples

Reference Books:

 1. The Complete Reference – JAVA Herbert Schildt

 2. Core java –II by Cay S. Horstmann and Gary Cornell

 3. Complete Reference J2EE – Jim Keogh

Website Reference Link:

- www.W3schools.com
- https://www.javatpoint.com

Academic Year 2023-2024

Class   : S.Y.BBA (C.A.) (Semester - IV)

Paper Code   : UBCA242A   Title of Paper: Advanced PHP

Credit: 3   No. of. Lectures: 48

A] Learning Objectives:

1. To know & understand concepts of internet programming.
2. Understand how server-side programming works on the web.
3. Understanding How to use WordPress.

B] Learning Outcomes:

1. Students will able to implement OOP's concept in PHP.
2. Students will able to write interactive programs using PHP.
3. Students will able to Analyze the construction of a web page and relate how
   PHP and XML combine to produce the web page.
4. Students will able to combine Ajax with PHP.
5. Students learn different type of web services.

Topics/ Contents

Unit 1   Introduction to Object Oriented Programming in PHP   (08L)

           1.1 Classes

           1.2 Objects

           1.3 Introspection

           1.4 Serialization

           1.5 Inheritance

           1.6 Interfaces

           1.7 Encapsulation

Unit 2   Web Techniques   (05L)

           2.1 Server information

           2.2 Processing forms

           2.3 Sticky forms

           2.4 Setting response headers

Unit 3   XML   (07L)

3.1 Introduction XML

3.2 XML document Structure

3.3 PHP and XML

3.4 XML parser

3.5 The document object model

3.6 The simple XML extension

3.7 Changing a value with simple XML

Unit 4   Ajax with PHP   (10L)

4.1 Understanding java scripts for AJAX

4.2 AJAX web application model

4.3 AJAX –PHP framework

4.4 Performing AJAX validation

4.5 Handling XML data using php and AJAX

4.6 Connecting database using php and AJAX

Unit 5   Introduction to Web Services   (08L)

5.1 Definition of web services

5.2 Basic operational model of web services, tools and
     technologies enabling web services

5.3 Benefits and challenges of using web services.

5.4 Web services Architecture and its characteristics

5.5 Core building blocks of web services

5.6 Standards and technologies available for implementing web
     services

5.7 Web services communication models

5.8 Basic steps of implementing web services.

Unit 6   WordPress   (10L)

6.1 **Installing WordPress**

6.1.1   Uploading WordPress to your Web Server

6.1.2   Installing WordPress

6.1.3   Database Connectivity

6.1.4   Theme Customization

6.2 **Configuring WordPress**

6.2.1   Using the WordPress Dashboard

Reference Books:

1. Php: A Beginner's Guide 1st EditionMcGraw-Hill Osborne Media; 1 edition byVikramVaswani

2. Murach's PHP and MySQL (2nd Edition)by Joel Murach and Ray Harris

3. PHP: The Complete Reference Paperback – 1 Jul 2017by Steven Holzner (Author)

4. Building Web Services with Java, 2nd Edition, S. Graham and others, Pearson Edn.,2008.

Website Reference Link:

- www.php.net.in

- www.W3schools.com

SYLLABUS (CBCS) FOR S.Y.BBA (C.A.) (w.e. from June, 2023)

Academic Year 2023-2024

Name of the Programme: BBA (Computer Application)

Class: S.Y.BBA (C.A.) (Semester - IV)

Paper Code: UBCA242B   Title of Paper: React JS

Credit: 3   No. of. Hours: 48

A] Learning Objectives:

1. Understand how Single Page React application is different than traditional web development frameworks.
2. Understand and use React, React Router, Redux, Redux Saga and other popular libraries.
3. Use styled-components to create presentational components (CSS in JS)
4. Understand the programming model provided by the React framework
5. Define React components.
6. Use the React framework to handle events and state full data.

B] Learning Outcomes:

By the end of the course, you will be able to:

1. To Create React Components
2. To Perform some simple tests
3. To Think in React
4. To Add state and props to an application
5. To Add inverse data flow to an application
6. To Use some common React Hooks
7. To Use external services to provide data
8. To Set up a single page application
9. To Use Context and Reducers

Topics/Contents

Unit 1   Introduction to React JS   (05L)

        1.1 Introduction

        1.2 What is React JS?

        1.3 Why React?

1.4 Advantages of React JS

1.5 React version history

1.6 React 16 vs React 15

1.7 Just React – Hello World

1.8 Using create-react-app

1.9 Anatomy of react project

1.10 Running the app

1.11 Debugging first react appion

Unit 2   **Overview of JSX**   (06L)

2.1 Introduction of Virtual DOM.

2.2 Difference between JS and JSX.

2.3 React Components Overview

2.4 Containers and Components

2.5 What is Child Components?

2.6 What is Name spaced Components?

2.7 What are the JavaScript expressions available in JSX?

Unit 3   **Real-Time Application By Using React JS**   (05L)

3.1 Create a React Component with JSX template.

3.2 How to create Nested Components?

3.3 What is React JS render?

3.4 React Props overview.

3.5 Introduction of Props validation with data types.

3.6 Flow of States, Initialize states and update states.

Unit 4   **React JS Forms And UI**   (07L)

4.1 Form Components.

4.2 Setup Controlled and Uncontrolled form components.

4.3 Control Input elements.

4.4 How to set default values on all formats of Input elements.

4.5 React JS Form validations.

4.6 React CSS Components

    4.6.1 Inline Styling

    4.6.2 CSS Stylesheet

    4.6.3 CSS Module

    4.6.4 Styled Component

4.7 Animations overview

Unit 5 **React JS Component**   (05L)

5.1 React Component Life-Cycle

5.2 Types of Components

5.2.1 Functional Components

5.2.2 Class based Components

5.2.3 Pure Components

5.2.4 Higher-Order Components

Unit 6 **Routing in React JS**   (06L)

6.1 What is a React Router?

6.2 Need for React Router

6.3 How to Add and Set up a React Router?

6.4 Components in React Router

6.4.1 BrowserRouter

6.4.2 HashRouter

6.5 What is Route?

6.6 Adding Navigation using Link component

Unit 7 **Event Handling**   (06L)

7.1 React Events : Naming

7.2 How to Define React Events?

7.3 What are Synthetic React Events?

7.4 Basics of React Event Handling

7.5 Event Handling in React: Additional Examples

7.6 Adding Events

7.7 Passing Arguments to Event Handler

Unit 8 **State Management in React JS**   (08L)

8.1 What is State?

8.2 Introduction to Redux

8.3 Redux store, actions and reducers

8.4 Connecting React Components to Redux store

Reference Books:

1. Full Stack React by Anthony Accomazzo, Nate Murray, Ari Lerner, Clay Allsopp, David Guttman, and Tyler McGinnis.

Website Reference Link:

1. https://legacy.reactjs.org/docs/forms.html
2. https://www.javatpoint.com/react-component-life-cycle
3. https://www.emizentech.com/blog/types-of-react-components.html
4. https://levelup.gitconnected.com/types-of-react-components-a38ce18e35ab
5. https://www.knowledgehut.com/blog/web-development/handling-react-events-guide

SYLLABUS (CBCS) FOR S.Y.BBA (C.A.) (w. e. from June, 2023)

Academic Year 2023-2024

Class   : S.Y.BBA (C.A.) Semester – IV)

Paper Code   : UBCA243   Title of Paper: Mathematical Foundation for

Computer Applications

Credit: 3   No. of. Lectures: 48

A] Learning Objectives:

1. To learn the basic functions and summation.
2. To understand the ideas of the basis step and the inductive step in a proof by mathematical induction.
3. To understand concepts of Determinants and Matrices.
4. To understand how to solve simultaneous equations using determinants and Matrix Theory.
5. To understand how to perform the operations of union, intersection, complement, and difference on sets using proper notation.

B] Learning Outcomes:

Student should be able to

1. Use correct and proper notation with prediction with predicates and variables to write valid induction proofs.
2. Utilize applications of matrices to solve industrial problem.
3. Basic knowledge of set theory, functions, and relations concepts,
4. Matrix needed for designing and solving problems.
5. Construct simple mathematical proofs and possess the ability to verify.
   them.

Topics/Contents

Unit1   Sequence, Series and Mathematical Induction   **(10L)**

        1.1 Sequence and Series.

        1.2 Arithmetic Progression (A.P.), Arithmetic Mean (A.M.),

            Geometric Progression (G.P.), general term of a G.P., sum of n

            terms of a G.P. Arithmetic and geometric series, infinite G.P. and

            its sum, geometric mean (G.M.).

        1.3 Relation between A.M. and G.M.

        1.4 Process of the proof by induction

        1.5 The principle of mathematical induction and simple applications

Unit2   Sets   **(12L)**

        2.1 Introduction.

        2.2 Methods of describing of a set: Tabular form, Set builder form.

        2.3 Finite set, Infinite set, Empty set, Power set, Subset, Universal set,

            Equal sets, Disjoint sets, Complementary set.

        2.4 Operation on Sets: Union of sets, Intersection of sets, Difference

            of sets, Examples.

        2.5 De Morgan's Laws (without proof).

        2.6 Venn diagram, Examples.

        2.7 Cartesian product of two sets, Examples.

        2.8 Idempotent laws, Identity laws, Commutative Laws, Associative

            laws, Distributive laws, Inverse laws, Involution laws.

        2.9 Duality.

        2.10 Examples based on above.

Unit 3   Relations and Functions   **(12L)**

        3.1 Relation: Binary relations as ordered pairs and verbal description

        3.2 The reflexive, symmetric, transitive and antisymmetric properties

            of binary relations.

        3.3 Functions: Definition and examples

3.4 Properties of functions

3.5 one-to-one, onto, bijective

3.6 function composition, inverse function

3.7 Examples based on above.

Unit 4   **Matrix and Determinant**   **(14L)**

4.1 Introduction.

4.2 Types of matrices: Row matrix, Column matrix, Null matrix, Unit matrix, Square Matrix, Diagonal matrix, Scalar matrix, Symmetric matrix, Skew -symmetric matrix, Transpose of a matrix.

4.3 Definition of Determinants of order 2nd & 3rd and their expansions.

4.4 Singular and Non-Singular Matrices.

4.5 Algebra of Matrices: Equality of matrices, Scalar Multiplication of Matrix, Addition of matrices, Subtraction of matrices, Multiplication of matrices.

4.6 Elementary Row & Column Transformations.

4.7 Inverse of Matrix.

4.8 Examples based on above

Reference Books:

1) Mathematical Foundations of Data analysis – Jeft. M. Phillips

2) Calculus and Linear Algebra - Book by Donald John Lewis and Wilfred Kaplan

3) Vector Calculus, Linear Algebra, and Differential Forms- John H. Hubbard, BarbaraHubbard

4) Discrete Mathematics & Structures by Satinder Bal Gupta, University Science Press

5) Fundamental Approach to Discrete Mathematics by D. P. Acharjya,

Name of the Programme: BBA (Computer Application)

Class: S.Y.BBA (C.A.) (Semester - IV)

Paper Code: UBCA244   Title of Paper: Software Testing and Automation

Credit: 3   No. of. Hours: 48

A] Learning Objectives:

1. To understand the basics of Software Testing.

2. To understand how to test bugs in Software.

3. To learn how to do the Testing and Planning effectively.

4. To build test cases and execute them.

5. To understand the basic of quality software and quality factors.

B] Learning Outcomes:

1. Understand the basic concepts of software testing and the need for software testing

2**.** Design Test planning and different activities involved in test planning

3**.** Design effective test cases that can uncover critical defects in the application

4**.** Carry out advanced types of testing

5. Automate the software testing using Selenium and TestNG.

Topics/Contents

Unit1   Software Testing   **(07L)**

1.1 Introduction, Nature of Errors,

1.2 Testing Objectives

1.3 Testing Principles

1.4 Testing Fundamentals,

1.5 Software Testing Life Cycle

1.6 Bug Life Cycle

1.7 Debugging

Unit2   **Approaches to Testing –Testing Methods**   **(07L)**

    2.1 White Box Testing and Types of White Box Testing

    2.2 Test Case Design

    2.3 Black Box Testing and Types of Black Box Testing

    2.4 Gray Box Testing

Unit3   **Software Testing Strategies**   **(10L)**

    3.1 Software Testing Process

    3.2 Unit Testing

    3.3 Integration- Top-down ,Bottom up

    3.4 System Testing

    3.5 Acceptance Testing (Alpha, Beta Testing)

    3.6 Validation and Verification

    3.7 Big Bang Approach

    3.8 Sandwich Approach

    3.9 Performance Testing

    3.10 Regression Testing

    3.11 Smoke Testing

    3.13 Load Testing

Unit4   **Testing for Specialized Environments**   **(06L)**

    4.1 Testing GUI's

    4.2 Testing of Client/Server Architectures

    4.3 Testing Documentation and Help Facilities

    4.4 Testing for Real-Time Systems

Unit5   **Testing Tools& Software Quality Assurance (Introduction)**   **(10L)**

    5.1 JUnit(TestNG), Apache JMeter, Win runner

    5.2 Load runner, Rational Robot

    5.3Ranorex

    5.4 Headpin,

    5.5 Sqish

    5.6 QTP

    5.7 Definition of Quality, QA,QC,SQA

    5.8 SQA Planning

    5.9 SQA Activities

5.10 Software Quality Assurance Metrics –

5.11 Measurement Software Quality Metrics

5.12 Product Quality Metrics

5.13 In-Process Quality Metrics

Unit6   Test Automation and Tools   (08L)

6.1 Automated Software Testing

6.2 Automate Testing of Web Applications

6.3 Selenium: Introducing Web Driver and Web Elements

6.4 Locating Web Elements, Actions on Web Elements, Different
Web Drivers

6.5 Understanding Web Driver Events, Testing: Understanding
Testing.xml, Adding Classes, Packages, Methods to Test, Test
Reports.

References Books:

1. Yogesh Singh, "Software Testing", Cambridge University Press, 2012

2. Unmesh Gundecha, Satya Avasarala, "Selenium WebDriver 3 Practical Guide" - Second
Edition 2018

3. Glenford J. Myers, Corey Sandler, Tom Badgett, the Art of Software Testing, 3rd Edition,
2012, John Wiley & Sons, Inc.

4. Ron Patton, Software testing, 2nd Edition, 2006, Sams Publishing

5. Carl Cocchiaro, Selenium Framework Design in Data-Driven Testing, 2018, Packt Publishing.

6. Elfriede Dustin, Thom Garrett, Bernie Gaurf, Implementing Automated Software Testing,
2009, Pearson Education, Inc.

7. Satya Avasarala, Selenium WebDriver Practical Guide, 2014, Packt Publishing.

8. Varun Menon, TestNg Beginner's Guide, 2013, Packt Publishing.

9. Total quality management, Dale H.Bestrefield, Prentice Hall,2003

Website Reference Link:

1.   www.opensourcetesting.org

Class   : S.Y.BBA (C.A.) (Semester - IV)

Paper Code   : UBCA245   Title of Paper: Networking

Credit: 3   No. of. Lectures: 48

A] Learning Objectives:

1. To understand various computer networks and technologies behind networks
2. To study TCP/IP suite.
3. To study routing concept along with Routing protocols
4. To be familiar with wireless networking concepts and protocols

B] Learning Outcomes:

   Student should be able to

1. Understand various computer networks and technologies behind networks
2. Learn TCP/IP suite
3. Learn routing concept along with Routing protocols
4. Get knowledge of wireless networking concepts and protocols

Topics/Contents

Unit 1:   Introduction to Data Communication and Computer   (06L)

Networks

1.1   Overview of Basic Concepts and Components. Data

Communication Characteristic, Data Representation, Data

Flow, Network Criteria, Physical Structures and

Topologies, Network Types- LAN, MAN, WAN

1.2   Internet

1.2.1 Concept of Intranet & Extranet

1.2.2 Internet Information Server (IIS)

1.2.3 World Wide Web(WWW)

1.2.4 Search Engine

1.2.5 Internet Service Providers (ISP)

1.3   Various types of Networks (only overview)

      1.3.1   Connection Oriented N/W's Vs.

           Connectionless N/W'

      1.3.2   Ethernet

      1.3.3   Wireless LAN

      1.3.4   X.25

      1.3.5   ATM

Unit 2: **Principles of Layering Concept**   (10L)

    2.1   Need for Layering

    2.2   ISO-OSI 7 Layer Model

    2.3   TCP/IP Model

    2.4   Comparison of ISO-OSI&TCP/IP Model

    2.5   Physical Communication:

      2.5.1   Hardware Architecture

      2.5.2   Transmission Media

          (Guided and Unguided   i.e. Twisted Pair, Coaxial

          Cable, Fiber Optics, Wireless Transmission etc.)

      2.5.3   Communication Devices (Switch, Router etc.)

      2.5.4   Switching and its Types

    (Circuit Switching, Message Switching, Packet Switching)

Unit 3: **Link Layer Communication**   (08L)

    3.1   Error Detection and Correction Techniques

    3.2   Framing and its Types

    3.3   Flow and Error Control

    3.4   HDLC Protocol

    3.5   P2P Protocol

    Note: Examples based on 3.1 to be covered

Unit 4: **IP Addressing & Routing**   (08L)

    4.1   Internet Protocol and IPv4 Packet Format

    4.2   Addressing, Physical Addresses, Logical Addresses

       Port Addresses, Specific Addresses

    4.3   IP Address- Network Part and Host Part

    4.4   Network Masks, Network Addresses and, Broadcast

Addresses, Loop Back Address

    4.5   Address Classes

    4.6   TCP and UDP Connections

    4.7   Overview of IPv6

Notes: Examples based on IP addressing to be covered

Unit 5:   Routing Protocol   (04L)

    5.1   IP Routing Concept,

    5.2   Routing Tables

    5.3   Routing Protocols – RIP, IGRP, EIGRP,OSPF,BGP

            Domain Name System (DNS)

    5.4   Domain Namespace

    5.5   DNS in the Internet

    5.6   DNS Resolution and Caching

    5.7   Resource Records, DNS Message

Unit 6:   Network Applications   (08L)

    6.1   Hyper Text Transfer Protocol (HTTP), HTTP

            Communications –HTTP Request, Request,

            Headers, Responses, Status Code, Error Status Code

    6.2   Email- Sending & Receiving Email, Email

          Addressing, Message Structure, SMTP – Simple Mail

        Transfer Protocol, POP – Post Office Protocol, IMAP-

        Internet Message Access Protocol, FTP- File Transfer

        Protocol

Unit 7:   Overview of Network Security   (04L)

    7.1   Active and Passive Attacks

    7.2   Cryptography (Symmetric and Asymmetric)

    7.3   Firewall

Reference Books:

1. Computer Networks Abndrew S. Tanenbaum4e

2. Data Communication and Networking Behroz A. Forouzan, TMH, 4thEd

3. Cryptography and Network Security Atul Kahate, TMH 2ndEd.

4. Network Essential Notes GSW MCSE Study Notes