Bharatiya Vidya Bhavan

BHAVAN'S VIVEKANANDA COLLEGE

OF SCIENCE, HUMANITIES & COMMERCE

Sainikpuri, Secunderabad-500094

(Reaccredited with 'A' Grade by NAAC)

Autonomous College – Affiliated to Osmania University

Department of Computer Science

PROGRAM NAME : B.Sc. (Computer Science)

COURSE NAME: Programming in Java

(w.e.f. 2025-26)

COURSE CODE: CS525 **YEAR/SEMESTER: III/V**

PPW: 4 **NO. OF CREDITS : 4**

COURSE OBJECTIVE: To enable students, understand the concepts of Java Programming and develop GUI applications.

UNIT-WISE COURSE OBJECTIVES:

COb1: To discuss the features of Java and construct class programs with methods.

COb2: To illustrate types of Inheritance, Packages and Arrays concepts.

COb3: To implement the concepts of Exception handling, Multithreading and Input/Output.

COb4: To apply the concepts of JavaFX.

UNIT-I:

Introduction

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Structure of Java Program, Type Casting, Classes, Objects, Class Declaration, Creating Objects.

Method Declaration and Invocation, Method Overloading, Constructors – Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects.

Class Variables &Method-static Keyword, this Keyword, Command-Line Arguments.

(BOOK 1: Ch: 2.4, 2.5, 2.6, 2.7, 3.2, 3.8, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.11)

UNIT-II:

Inheritance, Pakeges, Arrays

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keyword, Abstract classes, Interfaces, Abstract Classes Versus Interfaces.

Packages: Creating and Using Packages, Access Protection.

Arrays: One-Dimensional Arrays, Two-Dimensional Arrays, Wrapper Classes, String Class.

(BOOK 1: Ch: 5.1.1, 5.1.2,5.2,5.3,5.4,5.5,6.1,6.1.3,6.2,4.10,6.3.2,6.3.3)

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UNIT-III:

Exception , Multithreading,Input/Output

Exception: Introduction, Types, Exception Handling Techniques-try, catch, multiple catch, User-Defined Exception.

Multithreading: Introduction, Main Thread and Creation of New Threads –By Inheriting the Thread Class, Thread Lifecycle, Thread Priority.

Input/Output: Introduction, java.io Package, Reading and Writing Data- Reading/Writing Console User Input, Scanner Class, Reading/Writing Buffered Byte Stream Classes-BufferedInputStream Class, BufferedOutputStream Class.

(BOOK 1: Ch: 7.1, 7.2, 7.3, 8.1, 8.4, 8.5, 8.6, 8.7, 9.1, 9.2, 9.3.2. 9.3.4)

UNIT-IV:

JavaFX Basics, Event-Driven Programming and Animations, JavaFX UI Controls and Multimedia

JavaFX Basics: Introduction, Java, The Basic Structure of a JavaFX Program, Panes, UI Controls, and Shapes, Property Binding, Common Properties and Methods for Nodes, The Color Class, The Font Class, The Image and ImageView Classes, Layout Panes, Shapes.

Event-Driven Programming and Animations: Introduction, Events and Event Sources, Registering Handlers and Handling Events. Simplifying Event Handling Using Lambda Expressions, Mouse Events, Key Events, Listeners for Observable Objects, Animation.

JavaFX UI Controls and Multimedia: Introduction, Labeled and Label, Button, CheckBox, RadioButton,TextField, TextArea, ComboBox, ListView.

(BOOK 2: Ch :14: 14.1, 14.3,14.4, 14.5, 14.6, 14.7, 14.8, 14.9, 14.10, 14.11; Ch:15 : 15.1, 15.2, 15.3, 15.6, 15,8, 15.9, 15.10, 15.11; Ch:16: 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9)

Prescribed Books:

1. **Programming in Java**, Sachin Malhotra, Saurabh Choudhary, Oxford University Press, Second edition, 2018.
2. **Introduction to Java Programming**, Comprehensive Version, Tenth Edition, Y. Daniel Liang, Pearson Education, 2022.

Reference Books:

1. **Thinking in Java**, Bruce Eckel, Pearson Edition, Fourth Edition, 2008.
2. **Java: The Complete Reference**, Herbert Schildt, Tata McGraw Hill; Eleventh edition, 2020.
3. **Introduction to Java Programming**, Y. Daniel Liang, Pearson Education; Tenth edition, 2018.
4. **Java: How To Program**, Paul Deitel, Harvey Deitel, Pearson Education; Eleventh edition, 2018.
5. **Core Java Volume I – Fundamentals**, Cay S. Horstmann, Pearson Education; Eleventh edition, 2020.

COURSE OUTCOMES:

At the end of the course, students will be able to:

CO1: Comprehend the features of Java and construct class programs with methods.
CO2: Apply the concepts of Inheritance, Packages and Arrays concepts.
CO3: Program the concepts of Exception handling, Multithreading and Input/Output.
CO4: Develop GUI programs using JavaFX.

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Academic Year: 2026-2027

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)
COURSE NAME : Programming in Java Lab

(w.e.f. 2025-26)

COURSE CODE: CS525P | **YEAR/SEMESTER : III/V**
PPW: 2 | **NO. OF CREDITS : 1**

COURSE OBJECTIVE: Enable students to apply Object-Oriented Concepts and develop GUI applications.

UNIT-WISE COURSE OBJECTIVES:
COb1: Learn to program concepts of OOPs, Arrays, Exception handling.
COb2: To illustrate the concepts of Multithreading, Input/Output, JavaFX components.

1. Installation and Configuring Visual Studio Code IDE.
2. Installation and Configuring NetBeans IDE.
3. Write a program to find whether a given number is prime or not.
4. Write a menu driven program for following:
   a. Display a Fibonacci series
   b. Compute Factorial of a number
5. Write a program to create an array of 10 integers. Accept values from the user and store them in the array. Then, input another number from the user and find how many numbers in the array are equal to, greater than, and less than the number entered.
6. Write a program that computes the area of a circle, rectangle and a Cylinder using Method overloading.
7. Write a program to demonstrate about types of constructors.
8. Write a program to demonstrate about inner classes.
9. Write a program to demonstrate Method Overriding.
10. Write a program for the implementation of multiple inheritance using Interface to calculate the area of a rectangle and triangle.
11. Write a program to create a package called Arithmetic that deals with arithmetic operations.
12. Write a program to demonstrate throws and finally keywords.
13. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage () prints the information about the error occurring causes.
14. Write a program to demonstrate StringBuffer class Methods.

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15. Write a program to demonstrate Multithreading using Runnable Interface.
16. Write a program to demonstrate Synchronization in Multithreading.
17. Write a program to demonstrate FileInputStream and FileOutputStream Class.
18. Write a program to demonstrate RandomAccessFile Class.
19. Write a program to display your name, address and qualification in the frame window using awt components.
20. Write a program to demonstrate Components in Swings.
21. Write a program to create Label, TextField, TextArea and Button using JavaFX.
22. Write a program to create RadioButtons and Checkboxes using JavaFX.
23. Write a program to create calculator using JavaFX.

Case Studies:

24. Banking System UI (ATM Simulation)[using Multithreading, Synchronization, JavaFX]

A banking system is designed to simulate ATM operations using a JavaFX-based user interface. The system allows users to perform transactions such as depositing and withdrawing money from a shared account.

To improve performance, the system uses multithreading, where each transaction is executed in a separate thread. However, when multiple users attempt to withdraw money at the same time, the system may produce an incorrect account balance due to simultaneous access to shared data.

To ensure correctness, the system must implement synchronization mechanisms to control access to the account and maintain data consistency.

a. Explain how multithreading is used in the ATM simulation system.
b. Identify the synchronization problem that may occur during simultaneous transactions.
c. Describe how synchronization (using locks or synchronized methods) can solve this issue.
d. Write a Java program using JavaFX to simulate the ATM system with proper multithreading and synchronization.

25. E-Learning platform [Inheritance and Packages]

An E-Learning platform is designed to manage different types of users such as students and instructors, along with courses and learning content. Each user has specific roles and responsibilities—for example, students enroll in courses while instructors create and upload content.

To build an efficient and scalable system, the platform uses object-oriented concepts like inheritance to define relationships between users and packages to organize different modules such as users, courses, and content management.

a. Explain how inheritance is used in the E-Learning platform to manage different user roles.
b. Identify the base class and derived classes in this system.
c. Describe how packages help in organizing the platform into modules.
d. Discuss the advantages of using inheritance and packages in this scenario

COURSE OUTCOMES:

At the end of the course, students will be able to:

CO1: Apply OOPs Concepts, Arrays and Exception handling.
CO2: Implement Multithreading, Input/Output, JavaFX Components.

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME : Information Technologies (GE)

(w.e.f. 2025-2026)

COURSE CODE: GE525A **YEAR/SEMESTER: III/V**

PPW: 4 **NO. OF CREDITS : 4**

COURSE OBJECTIVE: To provide a fundamental understanding of cyber security, information systems, cyber laws, and safe practices for secure use of digital technologies.

UNIT-WISE COURSE OBJECTIVES:

CO1: To introduce the fundamental concepts of cyber security, cyberspace, and the CIA triad in a simple and practical manner.

CO2: To create awareness about various cyber threats, attacks, and malware using real-life examples.

CO3: To impart knowledge of safe computing practices, password management, and basic cyber-attack prevention techniques.

CO4: To provide an understanding of cyber forensics, wireless security, and security standards for safe digital usage.

UNIT - I:

Introduction to Information Systems and Security, Development of IS

Introduction to Information Systems and Security: Information Systems, IS Components, trends in IS, IS and Business Organization, IS Failures and Causes , Types of Information Systems.

Development of IS: Waterfall Model, Prototyping Model, Evolutionary Model, Spiral Model, and Incremental Model.

(BOOK 1: Ch: 1)

UNIT - II:

Introduction to Information Security, Introduction to Application Security and Counter Measures

Introduction to Information Security: Need for Information Security, Threats to Information Systems, Information Assurance, Cyber Security.

Introduction to Application Security and Counter Measures: Introduction to Application Security, Data Security Considerations, Security Technologies - Firewalls, VPN, Intrusion monitoring and Detection.

(BOOK 1: Ch: 1, 2)

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UNIT - III:

Introduction to security Policies and Cyber Laws, Objective and Scope of the IT Act – 2000

Introduction to security Policies and Cyber Laws: Need for Information Security Policy, Information Security Standards, Introduction to Indian Cyber Law – Need for Cyber laws.

Objective and Scope of the IT Act – 2000: Intellectual Property Issues, Patent – The patent System, Procedure for obtaining Patent, Copyright – Software License.

(BOOK 1: Ch: 4)

UNIT - IV:

HTML: Introduction-HTML, XML and World Wide Web, Basic HTML, The document body, Text, Hyperlinks, Adding more Formats, Lists, Tables, Using Colors and Images. Images, Images-A Worked Example.

Cascading Style Sheets - Introduction, using styles simple examples, Defining Your Own Styles-Cascading Styles, Rules.

(BOOK 2: Ch:1, 2, 3, 4)

Prescribed Books:

1. **Introduction to Information Security and Cyber Laws**, Dr. Surya Prakash T, Ritendra G, Praveen Kumar S, Dreamtech Publication, Simplified Chinese Edition, 2014.
2. **Web Programming: Building Internet Applications**, Chris Bates, Wiley, Third edition, 2007.

COURSE OUTCOMES:

At the end of the course, students will be able to:

CO1: Describe Information Systems and the need for Information Security.
CO2: Apply application security techniques and identify security tools.
CO3: Summarize security policies and Indian cyber laws.
CO4: Create web pages using HTML and enhance them with CSS.

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME: Multimedia Applications using GIMP (GE)

(w.e.f. 2025-2026)

COURSE CODE: GE525B **YEAR/SEMESTER: III/V**

PPW: 4 **NO. OF CREDITS : 4**

COURSE OBJECTIVE: To provide students with essential skills in multimedia applications by exploring audio-visual (AV) formats, editing images using GIMP, and applying creative photo enhancement techniques.

UNIT-WISE COURSE OBJECTIVES:

COb1: Demonstrate the basics of multimedia applications and discuss audio-visual (AV) formats.

COb2: Illustrate the use of layers in GIMP.

COb3: Demonstrate the use of color, selection, text, and drawing tools.

COb4: Create photo retouching effects and apply filter effects.

UNIT- I: Introduction to Multimedia, AV formats

Introduction to multimedia, Definition, uses of multimedia (multimedia applications), Making Multimedia: Stages of a multimedia project, Requirements to make good multimedia application, Multimedia software and authoring tools, Multimedia Hardware.

Audio and Video: Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats, Video- How video works, analog video, digital video, video file formats.

(BOOK 1: Ch: 1, 4, 6, 7)

UNIT - II: GIMP basics, Display and Layers

GIMP Basic- The GIMP Interface: The main Windows, Fundamental GIMP commands, Working with GIMP interface, Creating, loading, saving and exporting files, Undoing. Display - Rulers and units, Guides, Grids, Zoom, Multiple views.

Layers : Layer dialog, Layers menu, Layer Groups, The image- Layer menu, The mask, transparency and transform menus.

(BOOK 2: Ch: 1,9,10, 11)

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UNIT- III: Handling Color, Selection, Drawing and image

Color : Color Models, Blending Modes, Color Management, Major Color tools, Additional Color tools.
Selection: Basics, Seven Selection tools, Paths Tools, using selections.
Drawing tools: Digital Art, Overview of drawing tools, shared features, Fill tools, paining tools, Cloning tools, Modifying tools, text tool, color picker tool, brushes and paint dynamics.
Image handling basics: Working with images.
Transformation tools: Global transformation, Local transformation.
(BOOK 2: Ch: 12, 13,15, 16)

Unit - IV: Retouching effects and filters

Photograph Retouching: Enhancing photographs, retouching a scanned photograph.
Drawing and Illustrations: Colorizing a drawing, Pointing and drawing, Filling on area, Dodging, burning and smudging, The digital painting process. Drawing shapes.
Filters: Common properties, Blur, Enhance filters, Distorts filters, Light and shadow filters, Noise filters, Edge-Detect filters, Generic Filters, Artistic Filters, Décor filters, Map filters.
(BOOK 2: Ch: 3, 15,16,17)

Prescribed Books:

1. **Multimedia: Making it Work**, Vaughan, T., McGraw-Hill Professional, 9th ed., 2014.
2. **The Book of GIMP: A Definitive Guide for Photographers**, Artists, and Designers, Lecarme, O., & Delvare, K., No Starch Press, 2012.

Reference Books:

1. **Multimedia: Computing, Communications & Applications**, Steinmetz, R., & Nahrstedt, K., Pearson Education, 2002.
2. **Multimedia Handbook**, Keyes, J., McGraw-Hill, 1994.
3. **Multimedia Systems Design**, Andleigh, P. K., & Thakkar, K., Prentice-Hall of India, 2000.

COURSE OUTCOMES:

At the end of the course, students will be able to:
CO1: Analyze the file format and type of the given graphical content.
CO2: Apply the concepts of layered structure in graphic design.
CO3: Create images using drawing tools.
CO4: Implement various filter effects in graphic content.

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Department of Computer Science

PROGRAM NAME : B.Sc. (Computer Science)

COURSE NAME : Python Programming (GE)

(w.e.f. 2025-2026)

COURSE CODE: GE525C | **YEAR/SEMESTER : III/V**

PPW: 4 | **NO. OF CREDITS : 4**

COURSE OBJECTIVES: To familiarize the students with Python programming.

UNIT-WISE COURSE OBJECTIVES:

COb1: To demonstrate the basic concepts of Python programming.
COb2: To acquire knowledge of Control Statements and Functions.
COb3: To be able to demonstrate the concepts of Lists, Tuples, Strings, Dictionaries, and Sets.
COb4: To explain the importance of Object-Oriented Programming concepts.

UNIT-I: Introduction to Computers and Programming, Input, Processing and Output, Decision Structures and Boolean Logic

Introduction to Computers and Programming: Introduction, Hardware and Software, How Computers Store Data, How a Program Works, Using Python.

Input, Processing and Output: Designing a Program, Displaying Output with the print Function, Comments, Variables, Reading Input from the Keyboard, Performing Calculations.

Decision Structures and Boolean Logic: The if Statement, The if-else Statement, Nested Decision Structures and the if-elif-else Statement, Logical Operators, Boolean Variables.

(Ch: 1, 2, 3)

UNIT-II: Repetition Structures and Functions

Repetition Structures: Introduction to Repetition Structures, the while Loop: A Condition-Controlled Loop, The for Loop: A Count-Controlled Loop, Nested Loops.

Functions: Introduction to Functions, Defining and Calling a Void Function, Designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Introduction to Value-Returning Functions: Generating Random Numbers.

(Ch: 4, 5)

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UNIT-III: Lists, Tuples, Strings, Dictionaries, and Sets

Lists and Tuples: Sequences, Introduction to Lists, List Slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Tuples.
More about Strings: Basic String Operations, String Slicing.
Dictionaries and Sets: Dictionaries, Sets.
(Ch: 7, 8, 9)

UNIT-IV: Classes and Object-Oriented Programming, Inheritance, Recursion

Classes and Object-Oriented Programming: Procedural and Object-Oriented Programming, Classes, Working with Instances, Techniques for Designing Classes.
Inheritance: Introduction to Inheritance, Polymorphism.
Recursion: Introduction to Recursion.
(Ch: 10, 11, 12)

Prescribed Book:

Starting Out with Python – Tony Gaddis, Pearson Education Limited, Global Edition, Third Edition, 2015.

Reference Books:

1. **Core Python Programming** – Dr. R. Nageswara Rao, Dreamtech Press, Second Edition, 2019.
2. **Python for Beginners** – Harsh Bhasin, New Age International (P) Ltd Publishers, First Edition, 2019.
3. **Learning Python** – Mark Lutz, Davis Ascher, O'Reilly Media Inc., Second Edition, 2003.
4. **The Complete Reference Python** – Brown Martin C., McGraw Hill Education India, Fourth Edition, 2018.

COURSE OUTCOMES:

At the end of the course, students will be able to:

CO1: Write basic Python programs.
CO2: Execute Python programs using Loops and Functions.
CO3: Implement Lists, Tuples, Strings, and Dictionaries.
CO4: Apply the concepts of Classes, Objects, Inheritance, Polymorphism, and Recursion using Python.

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME : Introduction to Cyber Security (GE)

(w.e.f. 2026-2027)

COURSE CODE: GE525D **YEAR/SEMESTER: III/V**

PPW: 4 **NO. OF CREDITS : 4**

COURSE OBJECTIVE: To provide a fundamental understanding of cyber security, information systems, cyber laws, and safe practices for secure use of digital technologies.

UNIT-WISE COURSE OBJECTIVES:

CO1: To introduce the fundamental concepts of cyber security, cyberspace, and the CIA triad in a simple and practical manner.

CO2: To create awareness about various cyber threats, attacks, and malware using real-life examples.

CO3: To impart knowledge of safe computing practices, password management, and basic cyber attack prevention techniques.

CO4: To provide an understanding of cyber forensics, wireless security, and security standards for safe digital usage.

UNIT I :

Foundations of Cyber Security and Cyber Threat Landscape

Introduction to Cyber Security: Definition, Importance, Objectives of cyberattacks

Overview of Cyberspace – Components and Architecture of the Internet, CIA Triad – Confidentiality, Integrity, Availability

Types of Cyber attacks: Introduction to different Cyber Attacks like - Denial of Service (DoS), Distributed Denial of Service (DDoS), Man-in-the-Middle (MITM) attack, Cyberterrorism, Phishing, CyberStalking, Spamming (with Live Examples).

(Book 1 : Ch: 2,3,4)

UNIT II :

Malware, System Vulnerabilities, and Secure Computing Practices

Types of Malware: Viruses, Worms, Trojans, Rootkit, Spyware, Adware, Scareware, Browser Hijacker (with Live Examples).

Securing Your Computers : Introduction, Firewall Settings, Antivirus Software, Anti-Spyware software, Anti-Spam Software, Security updates, Secure Browsing Settings, Types of Social Engineering Attacks and its attack precautions(with real life case study).

(Book 1 : Ch: 5,6)

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UNIT III :

Password Management and Cyber Attack Prevention Techniques

Password Management: Introduction, Basics of Passwords, Effective Password managements tips, Creating and managing secure password, password management tools.

Prevention from Cyber-attacks : Introduction, Firewalls, Intrusion Detection/ Prevention System, Multi-Factor Authentication .

(Book 1 : Ch: 7,8)

UNIT IV :

Cyber Forensics, Wireless Security, and Security Standards

Wireless Network Security : Introduction , LAN Vulnerabilities, Wireless WAN Vulnerabilities, IoT Vulnerabilities, Wireless Network Security measures.

Cyber Security Standards : Introduction, ISO/IEC standards, Information Security Forum (ISF), Payment Card Industry Data Security Standards (PCI/DSS)

(Book 1 : Ch: 9,12)

PRESCRIBED TEXTBOOK:

Kutub Thakur, A. Sakib Khan Pathan (2022). Cybersecurity fundamentals: A real-world perspective. CRC Press, Taylor & Francis Group.

REFERENCE BOOKS:

1. Godbole, N., & Belapure, S., Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives (1st ed.). Wiley India, 2011.
2. Stallings, W., & Brown, L., Computer Security: Principles and Practice (4E). Pearson Education, 2018.
3. Pfleeger, C. P., & Pfleeger, S. L., Security in Computing (5E). Pearson Education, 2015.
4. Andress, J., The Basics of Information Security: Understanding the Fundamentals of InfoSec (2E). Syngress (Elsevier), 2014.
5. Ozkaya, E., Cybersecurity: The Beginner's Guide (1E). Packt Publishing, 2019
6. Ciampa, M., Security+ Guide to Network Security Fundamentals (6E). Cengage Learning, 2018.

COURSE OUTCOMES:

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

CO1: Understand the fundamental concepts of cyber security, cyberspace, and the CIA triad.

CO2: Identify and explain various cyber threats, attacks, and types of malware.

CO3: Apply safe computing practices, including password management and basic cyber attack prevention techniques.

CO4: Demonstrate awareness of cyber forensics, wireless security, and security standards for secure digital usage.

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME: Web Technologies

(w.e.f. 2025-26)

COURSE CODE: CS625 | **YEAR/SEMESTER : III/VI**

PPW: 4 | **NO. OF CREDITS : 4**

COURSE OBJECTIVE:

This course is aimed to develop and provide a fundamental understanding of dynamic website creation using HTML, CSS, JavaScript, XML, and AJAX.

UNIT-WISE COURSE OBJECTIVES:

CObl: To analyze the structure of a web page and identify elements and attributes of HTML,CSS.
COb2: To illustrate JavaScript statements, operators, and functions.
COb3: To demonstrate dynamic web program using JavaScript events and objects.
COb4: To implement XML, DTD, Schemas, and Ajax (Asynchronous JavaScript and XML).

UNIT-I:

Introduction To XHTML, CASCADING STYLE SHEETS

Introduction To XHTML : Introduction, First HTML, Structure of HTML, Headings, Linking, Images, special characters and horizontal rules, Lists, Tables, Frames, Forms, Internal linking, meta Elements.Html5 –New Semantic elements in HTML5, HTML text-level semantics.

CASCADING STYLE SHEETS: Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking external sheets, Position Elements, box model and text flow, media types, building a CSS drop-down menu, user style sheets, CSS3.

BOOK 1: Ch: 4 (4.1, 4.3, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13); Ch: 5 (5.1 TO 5.6, 5.9 TO 5.13);
BOOK 2: Ch: 2-(31-44 Pages)

UNIT-II:

Introduction to Java Scripting, Control statements I, Control statements II, Functions

Introduction to Java Scripting: Introduction, simple program, prompt dialog and alert boxes, memory concepts, operators.

Control statements I: Decision making, control structures, if... else statement, switch statement, break and continue statements.

Control statements II: for Statement, Examples Using the for Statement, while, do..while statement, counter-controlled repetitions.

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Functions: Program modules in JavaScript, programmer-defined functions, function definition, scope rules, global functions, Recursion.

BOOK 1: Ch: 6 (6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7); Ch: 7 (7.4, 7.5, 7.6, 7.7, 7.11, 7.12) ; Ch: 8 (8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.9); Ch: 9 (9.2, 9.4, 9.8, 9.9, 9.10)

UNIT-III:

Arrays, Events, Java Script Objects

Arrays : Introduction, declaring and allocating arrays, references and reference parameters, passing arrays to functions. Multidimensional arrays.

Events : Registering event handling, event on loads, onmouseover, onmouseout, on focus, on blur, on submit, on reset, event bubbling, more events.

Java Script Objects : Introduction to object technology, Math Object, String Object, Date Object, Boolean and Number Object, document and window Objects, using cookies Introduction, Document Object Model (DOM) Introduction

BOOK 1: Ch: 10 (10.1, 10.3, 10.6, 10.7, 10.10); Ch: 13 (13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8, 13.9); Ch: 11 (11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9); Ch: 14.9.

UNIT-IV:

XML, Ajax-Enabled Rich Internet Applications, Responsive WebDesign (RWD)

XML: Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, Extensible Style sheet Language, CSS vs. XSL.

Ajax-Enabled Rich Internet Applications : Introduction, history of Ajax, traditional web applications vs. Ajax Applications.

Responsive WebDesign (RWD): Introduction to RWD, creating flexible Grid, working with Images-Fluid Images (Background Image, Max width, Auto width).

BOOK 1: Ch: 14 (14.1, 14.2, 14.3, 14.4, 14.5, 14.7, 14.8); Ch: 15 (15.1, 15.2, 15.3, 15.5, 15.6, 15.7, 15.8); BOOK 3: Ch: 1, 2, 3.

Prescribed Books:

1. **Internet & World Wide Web: HOW TO PROGRAM** - Paul Deitel, Harven Deitel, Abbey Deitel, Pearson Education; Fifth edition, 2018.
2. **Responsive Web Design with HTML5 and CSS** Develop future-proof responsive websites using the latest HTML5 and CSS techniques by Ben Frain,Third Edition, 2020.
3. **Responsive Web Design** Ethan Marcotte Foreword by Jeremy Keith, Second Edition, 2014.

Reference Books:

1. **Internet & World Wide Web: HOW TO PROGRAM** - H. M. Deitel, P. J. Deitel, Pearson Education, Fourth Edition, 2007.
2. **Web Programming: Building Internet Applications** - Chris Bates, Wiley, Third edition, 2007.
3. **HTML 5 Black Book**, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery – Thomas A Powell, Fifth Edition, 2010.

COURSE OUTCOMES:

At the end of the course, students will be able to:

CO1: Design static web pages using HTML and CSS.

CO2: Create web pages using JavaScript statements, operators, and functions.

CO3: Develop dynamic web pages using JavaScript (client-side programming).

CO4: Implement XML, DTD, Schemas, and interactive web applications using RWD.

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Department of Computer Science

PROGRAM NAME: B.Sc.(Computer Science)

COURSE NAME: Web Technologies LAB

(w.e.f. 2025-26)

COURSE CODE: CS625P **YEAR/SEMESTER : III/VI**

PPW: 2 **NO. OF CREDITS : 1**

COURSE OBJECTIVE: To develop an ability to design and implement static and dynamic Web pages.

UNIT-WISE COURSE OBJECTIVES:

COb1: Learn to design Web Pages by using HTML tags, Cascading style sheets.

COb2: Learn to develop JavaScript, XML and RWD.

1. Write a HTML program using
   a. Basic text formatting tags (H1 to H6, marquee, font, hr, br, pre).
   b. Physical formatting tags(<b>, <i>, <strike>, <sup>, <sub>, <big>, <small>).
   c. Logical formatting tags. (tags <block quote>, <cite>, <abbr>, <acronym>, <kbd>, <address>.
2. Demonstrate HTML List types to generate
   a. Menu for a Cafe site.
   b. Displays ingredients and instructions to prepare a recipe.
3. Write a HTML program using grouping elements and .
4. Write a HTML program to create your college website using multi-column layouts.
5. Demonstrate HTML5 semantic elements (any 5).
6. Write a HTML program using images, audios, videos.
7. Write a HTML program to create your time table.
8. Write a HTML program to create a student registration form using form controls (any 6).
9. Write a HTML program to create frames and links between frames.
10. Write a HTML program to create
    a. A External style sheet with background and text properties.
    b. Embedded style sheet with formats for list.
    c. Inline style sheet for table.
11. Write a HTML program to create CSS on links, lists, tables and generated content.
12. Write a HTML program to demonstrate text and image for a mobile layout using RWD.

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13. Write a JavaScript program to calculate the area of a rectangle using a function.
14. Write a JavaScript program to wish good morning, good afternoon, good evening depending on the current time.
15. Write a JavaScript program using switch case.
16. Write a JavaScript program to print the multiplication table of a given number using a loop.
17. Write a JavaScript program to create a registration form with validations.
18. Write a JavaScript program using JavaScript built-in objects (document).
19. Write a JavaScript program using any 5 events.
20. Write an XML Program to represent Student Data using DTD.

Model Web-Site Designing - Assignment

Create model websites using open source –GUI (Canva, Word Press, Site123).

COURSE OUTCOMES:

At the end of the course, students will be able to:

CO1: Acquire knowledge of complete HTML and CSS to develop a website.

CO2: Able to design dynamic web pages that are more interactive using JavaScript, XML and RWD.

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Autonomous College – Affiliated to Osmania University

Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME: PHP with MySQL

(w.e.f. 2025-26)

COURSE CODE: CS625A | **YEAR/SEMESTER : III/VI**

PPW: 3 | **NO. OF CREDITS : 3**

COURSE OBJECTIVE: To teach student how to build interactive websites and web application development using PHP and develop simple to complex web applications.

UNIT-WISE COURSE OBJECTIVES:

COb1: To understand the basics of PHP, setup a PHP web server, Decisions, Loops and Functions to manipulate strings.

COb2: To implement arrays, functions and read data.

COb3: To understand object-oriented programming concepts and files.

COb4: To explain storage mechanisms, to develop data-driven applications using PHP, sessions and cookies.

UNIT-I:

Introducing PHP, Your first PHP script ,PHP Language Basics, Strings

Introducing PHP: What is PHP? Why use PHP? Evolution of PHP.

Your first PHP script: Installing PHP, Other ways to run PHP, Creating your first script.

PHP Language Basics: Using variables, Understanding Data Types, Operators and Expressions, Constants.

Decisions and Loops: Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping with HTML.

Strings: Creating and Accessing Strings, Searching Strings, Replacing Text with Strings, Dealing with Upper and Lowercase, Formatting Strings.

(BOOK 1: Ch: 1, 2, 3, 4, 5)

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UNIT – II:

Arrays,Functions,Reading Data in Web pages

Arrays: Creating Arrays, Accessing Array Elements, Looping through Arrays with for-each, **Functions:** Creating Function

Reading Data in Web pages: Setting up web pages to communicate with PHP, Handling Text Fields, Text Areas, Checkboxes, Radio Buttons, List Boxes, Password Controls, Image Maps, File Uploads and Buttons.

PHP Browser

(BOOK 1: Ch: 6, 7), (BOOK 2: Ch: 5, 6)

UNIT–III:

Object oriented programming, Advanced OOP, File Handling

Object oriented programming: Creating Classes and objects, setting access to properties and methods, constructors, destructors, Inheritance, overriding and overloading methods, auto loading classes.

Advanced OOP: Static members and inheritance, Abstract classes, Interfaces, object iteration, comparing objects, class constants, final keyword, reflection.

File Handling: fopen, feof, fgets, closing a file, fgetc, file_get_contents, reading a file into an array with file, file_exists, filesize, fread, fscanf, parse_ini_file, stat, fseek, copy, unlink, fwrite, reading and writing binary files, appending a file, file_put_contents, locking files.

(BOOK 2 : Ch: 7, 8, 9).

UNIT – IV:

Introducing Databases and SQL, Retrieving Data from MySQL with PHP ,Manipulating MySQL Data with PHP

Introducing Databases and SQL: Deciding How to Store Data, Understanding Relational Databases, Setting Up MySQL, A Quick Play with MySQL, Connecting MySQL from PHP.

Retrieving Data from MySQL with PHP: Retrieving Data with SELECT, Creating a Member Record Viewer.

Manipulating MySQL Data with PHP: Inserting, Updating, and Deleting Records, Building a Member Registration Application.

Sessions, Cookies and FTP.

(BOOK 1: Ch: 12, 13, 14, BOOK 2: Ch: 11).

Prescribed Books:

1. **Beginning PHP 5.3**, Matt Doyle, Wrox, 1st edition, 2009.
2. **PHP: The Complete Reference Paperback**, Steven Holzner, McGraw Hill Education (India), Indian Edition, 2017.

COURSE OUTCOMES:

At the end of the course students will be able to:

CO1: Get an overview of PHP and basic coding in PHP.

CO2: Understand arrays, functions and read data.

CO3: Understand the concepts of OOPS.

CO4: Get an idea on how to handle the database and its operations.

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Academic Year: 2026-2027

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

COURSE NAME: PHP with MYSQL LAB

(w.e.f. 2025-26)

COURSE CODE: CS625AP **YEAR/SEMESTER : III/VI**

PPW: 2 **NO. OF CREDITS : 1**

COURSE OBJECTIVE: To equip students with the skills to develop dynamic web applications using PHP and MySQL by focusing on scripting, object-oriented programming, and database operations.

UNIT-WISE COURSE OBJECTIVES:

COb1 : To implement simple scripting programs using PHP.

COb2 : To execute various operations using PHP with MySQL on a local server.

1. Write a PHP script to display the Fibonacci sequence with HTML page.
2. Write a PHP script to create a chess board.
3. Write a PHP script using built-in string function like strstr(), strops(), substr_count(), etc...
4. Write a PHP script to transform a string to uppercase, lowercase letters, make a string"s first Character uppercase.
5. Write a PHP script to count number of elements in an array and display arange of array elements.
6. Write a PHP script using a function to display the entered string in reverse.
7. Write a PHP script to demonstrate inheritance.
8. Write a PHP script to demonstrate the object overloading with _get(), _set(), and _call().
9. Write a PHP script to demonstrate the method overloading and method overriding mechanisms.
10. Write a PHP script to demonstrate the use of final classes and final methods.
11. Write a PHP script to demonstrate the use of interfaces.
12. Write a PHP script using constructors and destructors.
13. Write a PHP application to handling HTML forms with PHP script.
14. Write a PHP script to create a file, write data into file and display the file's data.

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15. Write a PHP script to check and change file permissions, copying, renaming and deleting files.
16. Write a PHP application for connecting to MySQL and reading data from database table.
17. Write a PHP application for inserting, updating, deleting records in the database table.
18. Develop a PHP application for student registration form.
19. Develop a PHP application for creating, updating, reading and deleting the Student records from MYSQL Database

COURSE OUTCOMES:

At the end of the course students will be able to:

CO1 : Implement simple scripting codes in PHP.
CO2 : Execute various logics in PHP with MYSQL.

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Department of Computer Science

PROGRAM NAME: B.Sc. (Computer Science)

Project Work

(w.e.f. 2025-26)

COURSE CODE: CS625_PR | **YEAR/SEMESTER : III/VI**

PPW: 4 | **NO. OF CREDITS : 4**

Total Marks : 100

1. Internal Assessment – 20 Marks

First Seminar – 10 Marks

Timeline: Between 25–30 days after commencement of class work

Content:

- Study of Existing System
- Literature Survey
- Problem Definition

Second Seminar – 10 Marks

Timeline: Between 55–60 days after commencement of class work

Content:

- Requirements Specification
- System Analysis
- Design (DFD, ER Diagrams, UML Diagrams)
- Partial Implementation or Prototype

2. External Assessment – 80 Marks

Requirements:

- **Project Presentation** (10 minutes) + **Discussion/Q&A** (5 minutes)
- Submission of **Technical Write-up / Project Report**

Evaluation Criteria:

Component	Marks
Dissertation (Execution & Project Report)	50M
Presentation	15M
Viva Voce	15M
Total	80M

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General Formatting Guidelines

Font	: Times New Roman
Font Size	: 12 pt (Main text), 14 pt bold (Headings), 16 pt bold (Chapter titles)
Line Spacing	: 1.5
Margins	: 1 inch (Top, Bottom, Left, Right)
Alignment	: Justified
Page Numbering	: Bottom-center or bottom-right, starting from Chapter 1
Paper Size	: A4
Software	: MS Word or LaTeX (as per department norms)

Structure of the Documentation

Preliminary Pages

1. Cover Page (College Name, Title, Student Name, Roll No, Guide Name, Dept, Year)
2. Declaration by Student
3. Certificate by Guide/HoD
4. Acknowledgement
5. Abstract (150–300 words)
6. Table of Contents
7. List of Figures
8. List of Tables
9. Abbreviations/Glossary (if applicable)

Main Chapters

Chapter 1: Introduction

- Background of the Project
- Problem Statement
- Objectives
- Scope of the Project
- Methodology Summary
- Organization of the Report

Chapter 2: Literature Survey / Review

- Summary of existing solutions
- Limitations of current systems

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Chapter 3: System Analysis

- Feasibility Study
- Requirement Analysis
- Use Case Diagrams / Flow Diagrams

Chapter 4: System Design / Modeling Techniques

- High-Level Design (Modules, Interfaces)
- Detailed Design (ER Diagrams, Class Diagrams, etc.)
- Database Design (Schemas, Normalization)

Chapter 5: Implementation

- Technologies and Tools Used
- Frontend & Backend Description
- Modules Implemented

Chapter 6: Results and Discussion

- Screenshots of Outputs (graphs, Analysis results)

Chapter 7: Conclusion and Future Scope

- Limitations
- Recommendations for future improvements

References
Appendices (if required)

Additional Guidelines

- Include screenshots, diagrams, and tables for clarity
- Avoid grammatical and typographical errors
- All diagrams should be labeled and numbered chapter wise

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