



# School of Computer Science & IT Devi Ahilya Vishwavidyalaya

## SYLLABUS

### PGDCA 1 year

#### Program Educational Objectives (PEOs)

- PEO 1:** Ability to develop technically sound, financially viable and socially ethical solutions.
- PEO 2:** Produce competent team leaders, good communicators and ability to work in a multidisciplinary context while upholding moral principles.
- PEO 3:** Flexibility to adopt new technology and challenges with lifetime learning perspective.

#### Program Specific Outcomes (PSOs)

- PSO 1:** Acquire proficiency in key programming languages (such as C, C++, Java, Python) and development tools to design, develop, and test software applications tailored for various platforms.
- PSO 2:** Develop/ Customise IT solutions for e-governance, e-commerce, and other business applications.

## I - SEMESTER

## CCCS-5511: Operating Systems

**Aim:**

Understanding of modern computer's purpose, structure and functions of operating systems with illustration of key aspects through implementation.

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**Course Outcomes:**

- CO 1: Classify different types, design and architecture of operating system
  - CO 2: Analyze process management, I/O management, memory management functions of Operating System
  - CO 3: Solve numerical problems on Process Synchronization, CPU scheduling, Memory management and Disk management
  - CO 4: Explore file management and protection and security concepts
  - CO 5: Study and analyze various Operating Systems as research aspect
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**Unit-I**

Introduction: Evolution of operating systems, operating system concepts; activities, functions and services of operating system; Computer Systems: Mainframe, Desktop, Multiprocessors, Distributed, Clustered, Realtime and Handheld systems. Computer System Operations, Storage hierarchy, Hardware protection, System calls, System structures. Process Management: Process concepts, Process scheduling, Operation on processes.

**Unit-II**

Cooperating processes, Inter-process communication. Threads: multithreading models, threading issues, thread examples. CPU Scheduling: concepts, scheduling criteria, scheduling algorithms, algorithm evaluation. Process synchronization: Critical section problem, Mutual exclusion and synchronization Techniques of inter process: Synchronization hardware, semaphore, classical problems of synchronization, critical regions and monitors. Deadlock: deadlock characterization, deadlock handling methods.

**Unit-III**

Memory Management: Concepts, single user memory management. Partition memory allocation: paging, segmentation and segmentation with paging, Virtual memory management: concept, demand paging, process creation, page replacement, allocation of frames and thrashing.

**Unit-IV**

File Management: File concepts, access methods, directory structure, file system mounting, sharing and protection of files. File system structure and implementation, allocation methods, free space management, reliability of file system. Unix file system.

**Unit-V**

Device Management: Goals of input/output software design, Structure of device hardware and software. Layers of I/O software, structure of device drivers, Disk driver, disk arm scheduling algorithms, terminal driver, clock driver etc.

**Text Books:**

A. Silberschatz, P. Galvin and Gagne, Operating System Concepts, Addison Wesley, 6th Edition, 1994.

**Reference Book(s):**

Operating systems, 4th Edition, William Stallings, Pearson Education, 2003.

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## CCCS-4223: Programming and Problem-Solving Using Java

**Aim:**

To help students understand programming fundamentals and how to tackle complex challenges

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**Course Outcomes:**

- CO 1: To introduce the object-oriented programming concepts.
  - CO 2: To understand object-oriented programming concepts, and apply them in solving problems
  - CO 3: To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes
  - CO 4: To introduce the implementation of packages and interfaces
  - CO 5: To introduce the concepts of exception handling.
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**Unit-I**

Introduction to Java: History of Java, Features of Java, Object Orientated Programming Concept, Jdk installation and setup, How to write Java programs.

Data Types, Variables, Memory concept, Operators and Expressions.

Type Conversion and Type Casting, Control Statements, break and continue Statements, Looping Statement.

**Unit-II**

Introduction to Array and Constructor: Introduction to Array, Passing Array to Methods, Multidimensional Array, Searching and Sorting, Enhanced for Statement.

Command line Argument, Instant Variables, this keyword.

Method Overloading, Parameter Passing, Constructor, Type of Constructor.

**Unit-III**

Introduction to String and Inheritance: String class, String Methods, String Array, String Buffer, String Builder

Static keyword, Static Block, Static Method, Inheritance, Types of Inheritance, Relationship between Superclass and Subclass, Using super, Constructor in Subclasses, Method overriding, Runtime Polymorphism, final keyword, Abstract class and Methods.

**Unit-IV**

Packages and Interfaces: Defining a Package, Understanding CLASSPATH, Importing, Access Protection, Creating own packages.

Defining an Interface, Properties of Interface, advantages of Interface.

**Unit-V**

Exception Handling: Introduction, overview of doing it and keywords used, when to use it.

Exception Hierarchy, try catch, throw and throws, finally block.

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**Text Books:**

The Complete Reference by Herbert Schildt, Tata McGraw-Hill, 8th Edition, 2011

**Reference Book(s):**

Programming with Java by E Balagurusamy, 7th Edition, 2023.

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## CCCS-4601: Web Designing

**Aim:**

To develop an ability to design and implement static and dynamic website using web technology.

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**Course Outcomes:**

CO 1: Understand the fundamentals of Internet, and the principles of web design.

CO 2: Design static websites using HTML and Cascading Style Sheets.

CO 3: Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.

CO 4: Develop and host interactive websites.

CO 5:

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**Unit-I**

Web Design Principles: Basic principles involved in developing a web site, Planning process, Five Golden rules of web designing, Designing navigation bar, Page design, Home Page Layout, Design Concept.

Basics in Web Design: Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards, Audience requirement.

**Unit-II**

Introduction to HTML: What is HTML, HTML Documents, Basic structure of an HTML document, creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, and HTML Tags. Elements of HTML: Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

**Unit-III**

Introduction to Cascading Style Sheets: Concept of CSS, Creating Style Sheet, CSS Properties , CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties), CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Color, Creating page Layout and Site Designs.

**Unit-IV**

Introduction to JavaScript (JS), JS variables, datatypes, functions, alert, prompt, confirm, built-in objects: document, window, script tag, loop & conditional statements.

**Unit-V**

Introduction to Web Publishing or Hosting: Creating the Web Site, Saving the site, working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing websites.

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**Text Books:**

1. Schafer, Steven M. Web standards programmer's reference: HTML, CSS, JavaScript, Perl, Python, and PHP. John Wiley & Sons, 2007.
2. Batross, Ivan. Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI. Bpb Publications, 2010.

**Reference Book(s):**

1. Sebesta, Robert W. Programming the world wide web. Pearson Addison Wesley, 2008.
2. Glass, Michael K. , et al. Beginning PHP, Apache, MySQL Web Development. John Wiley & Sons, 2004.
3. Powell, Thomas A. HTML & CSS: the complete reference. Fifth Edition ,McGraw-Hill Professional, 2017.

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## CCIC-4916: Communication skills and Report Writing

### Aim:

To enhance students' confidence, communication skills, and presentation abilities, preparing them for success in placements and corporate life.

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### Course Outcomes:

- CO 1: Strengthening the ability to speak assertively in various situations.
  - CO 2: Improving both written communication and non verbal communication.
  - CO 3: Developing the ability to understand others' perspectives and respond thoughtfully.
  - CO 4: Learning to structure content logically for ease of understanding.
  - CO 5: Developing confidence to speak during Interviews and Group discussions.
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### Unit-I

Fundamentals of Communication : Definitions, Importance, Forms of communication, Process of communication, Channels, Barriers and Strategies to overcome barriers of communication.

### Unit-II

Listening: Definitions, Importance, Benefits, Barriers, Approaches, Exercise and cases. Group Discussions : Definitions, Importance, Process, Points to be borne in mind while participating, Do's and Don'ts.

### Unit-III

Presentation Skills, Interviews: Types of Interviews, Points to be borne in mind as an Interviewer or an Interviewee. Commonly asked questions. Do's and Don'ts.

### Unit-IV

Transactional Analysis, Johari Window. Written Communication: Report Writing, Business Correspondence, Preparation of Manuals and Project Report, Minutes of meeting, Notes and Circulars.

### Unit-V

Intense practice of Presentations, Group Discussions and Interviews.

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### Text Books:

1. Business Communication – K. K. Sinha
2. Organizational Behavior - Fred Luthans
3. Organizational Behavior - Stephen Robbins

### Reference Book(s):

1. Effective Business Communication – M.V. Rodrigues
2. Business Communication - Lesikar and Flately