

2. B.Sc. CS Semester - VI Syllabus

B.Sc. (CS) Semester – VI (Third Year)

Subject Title : Mobile Application Development
Subject Code : CSM304-3C
Subject Type : Major

Rationale:

The objective of this subject is to empower learners to analyze system requirements for Mobile Applications effectively. Students will gain the ability to create appropriate designs using specific Mobile Development Frameworks. The curriculum will guide students in developing and executing design, ensuring functionality and usability. By mastering targeted Mobile Application Development Frameworks, students will acquire practical skills essential for Mobile Application Development.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Describe the requirements for Mobile Applications.
- Explain the challenges in Mobile Application Design and Development.
- Develop design for Mobile Applications for specific requirements.
- Implement the design using Android SDK.
- Deploy the Mobile Application.

Teaching and Evaluation Scheme:

Credit	Duration in Hours		Maximum Marks		
	Theory	Practical	CCE (Formative)	SEE (Summative)	Total
4	30	60	50	50	100

Course Content:

Unit I

[Weightage=25% approx., Lectures=7, Practicals= 14]

Introduction to Mobile Applications: Introduction to mobile applications and their importance, Introduction to embedded systems, Market trends and business drivers for mobile applications, Publishing and delivery methods for mobile applications, Requirements gathering and validation processes for mobile applications, Introduction to mobile application development frameworks like Android, iOS, React Native.

Introduction to XML: Understanding XML Data Structure, Elements and Attributes, Storing and Extracting Data from XML in mobile applications.


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Unit II

[Weightage=25% approx., Lectures=7, Practicals = 16]

Designing Mobile Applications: Introduction to Embedded Systems Design, Fundamentals of Embedded Operating Systems, Design Constraints related to Hardware and Software in Mobile Applications, Architecture of Mobile Applications.

Android Fundamentals: Introduction to Android, Android Architecture, Android Development Environment; Development Tools: Android Studio, SDKs and AVDs; Android Application Structure: Manifest File, Resources and Gradle, Understanding Activities, Intents and the Application Lifecycle.

User Interface Widgets: Introduction of basic UI Components: Text Controls, Button Controls, Toggle Buttons, Dropdown and Image Views.

Unit III

[Weightage=25% approx., Lectures=8, Practicals= 14]

Notifications and Dialogs: Notifications: Toast Messages, Pending Intents, Status Bar Notifications; Menus: Options Menus, Context Menus; Dialogs: Alert Dialogs, Progress Dialogs.

Lists in Android: String Arrays, Simple Lists, Custom lists.

Unit IV

[Weightage=25% approx., Lectures=8, Practicals= 16]

Data Storage in Android: Internal Storage: Saving files in internal app-specific storage; External Storage: Managing files on external storage; Shared Preferences: Storing small amounts of key-value data; SQLite Database: Storing and Retrieving structured data.

Network Communication: Web Services: Understanding RESTful Web Services, Network Communication using HTTP client, XML and JSON Parsing.

Application Testing, Debugging and Publishing: Basic debugging techniques using Android Studio, Testing applications on Emulators and real devices; Preparing an application for Release: APK Generation and Signing, Basics of publishing applications, updates and versioning.

Text Books:

- Professional Android, 4th Edition, Reto Meier, Wrox (Wiley).

Reference Books:

- Android Programming for Beginners, John Horton, Packt Publishing.
- Head First Android Development, Dawn Griffiths and David Griffiths, Oreilly Media.
- Professional Android, Reto Meier, Wiley

Reference Links:


- Guides, APIs, and documentation: <http://developer.android.com/develop/index.html>
- Learn Android Development – Tutorials and examples: <https://codementor.io/learn-android-development>
- JavaTpoint Android Tutorial – <https://javatpoint.com/android-tutorial>
- Beginner-friendly Android guides: <https://tutorialspoint.com/android>
- Kotlin language reference and tutorials (used for Android): <https://kotlinlang.org>


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Practical List:

- Write an Android application to install and configure Android Studio and run a “Hello World” app.
- Write an Android application to explore and identify key components of an Android project structure.
- Write an Android application to create and parse XML data and display structured information.
- Write an Android application to design and implement multiple activities with explicit intents for navigation.
- Write an Android application to design and adapt responsive UIs using LinearLayout, RelativeLayout, and ConstraintLayout.
- Write an Android application to develop and implement TextView, EditText, and Button controls with event listeners.
- Write an Android application to integrate and toggle images using ImageView and ToggleButton.
- Write an Android application to generate and display Toasts and post Status Bar notifications using PendingIntent.
- Write an Android application to create and handle Options Menus, Context Menus, and AlertDialogs with user actions.
- Write an Android application to build and populate a ListView using string arrays and handle item selections.
- Write an Android application to develop and customize list items with an ArrayAdapter/BaseAdapter and handle clicks.
- Write an Android application to store and retrieve user preferences using SharedPreferences.
- Write an Android application to implement and perform SQLite CRUD operations (Create, Read, Update, Delete).
- Write an Android application to save and read files from external storage with proper runtime permissions.
- Write an Android application to fetch and parse JSON from a web API and display it in a list.


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B.Sc. CS Semester – VI (Third Year)

Subject Title : **Mobile Application Development**

Subject Code : **CSM304-3C**

Subject Type : **Major**

Course Outcomes (COs)

- **CO1:** Understand the fundamentals of mobile applications, embedded systems, development frameworks and XML usage in application development.
- **CO2:** Analyze mobile application design constraints, Android architecture, application structure, and UI components for effective interface design.
- **CO3:** Develop mobile applications using activities, intents, notifications, menus, and dialogs to enhance user interaction.
- **CO4:** Implement dynamic data handling in Android using lists and custom views.
- **CO5:** Apply techniques for storing and retrieving data using Shared Preferences, internal/external storage, and SQLite database in Android.
- **CO6:** Demonstrate skills in mobile application testing, debugging, publishing and managing updates using Android Studio.

Course Outcome Mapping Table

CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
CO1	Understand the fundamentals of mobile applications, embedded systems, development frameworks and XML usage in application development.	PO1, PO2, PSO1	U	F, C	5	10
CO2	Analyze mobile application design constraints, Android architecture, application structure, and UI components for effective interface design.	PO1, PO2, PO3, PSO1, PSO2	An	C, P	5	10
CO3	Develop mobile applications using activities, intents, notifications, menus, and dialogs to enhance user interaction.	PO2, PO3, PO6, PSO1, PSO2	Ap	P	5	10
CO4	Implement dynamic data handling in Android using lists and custom views.	PO2, PO3, PO6, PSO1, PSO2	Ap	P	5	10

CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
CO5	Apply techniques for storing and retrieving data using Shared Preferences, internal/external storage, and SQLite database in Android.	PO2, PO3, PO6, PO7, PSO1, PSO2	Ap	P	5	10
CO6	Demonstrate skills in mobile application testing, debugging, publishing and managing updates using Android Studio.	PO2, PO4, PO6, PO9, PSO2, PSO3	E	P, M	5	10
Total hour of Instruction					30	60

Mapping of COs with POs & PSO

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	0	0	0	0	0	0	0	0	3	0	0
CO2	3	3	3	0	0	0	0	0	0	0	3	3	0
CO3	0	3	3	0	0	3	0	0	0	0	3	3	0
CO4	0	3	3	0	0	3	0	0	0	0	3	3	0
CO5	0	3	3	0	0	3	1	0	0	0	3	3	0
CO6	0	3	0	1	0	3	0	0	1	0	0	3	1

3: High, 2: Medium, 1: Low



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B.Sc. (CS) Semester – VI (Third Year)

Subject Title : **Big Data Analytics**
Subject Code : **CSM305-3C**
Subject Type : **Major**

Rationale:

This course introduces the fundamentals of Big Data, its characteristics, challenges, and the role of NoSQL databases in handling unstructured data. Students learn the Hadoop ecosystem, including HDFS, MapReduce, Hive and HBase for distributed data storage and processing. The course also covers Apache Spark for real-time analytics and MongoDB for document-oriented database management. Students learn graph analytics and Data Visualization Techniques.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Understand Big Data Characteristics, Challenges and Applications.
- Differentiate between NoSQL Database Types.
- Work with Hadoop Ecosystem Components (HDFS, Hive, HBase).
- Implement Data Processing Pipelines using Apache Spark.
- Perform Graph Analytics with Neo4j and GraphX.
- Apply Data Visualization Techniques.

Teaching and Evaluation Scheme:

Credit	Duration in Hours		Maximum Marks		
	Theory	Practical	CCE (Formative)	SEE (Summative)	Total
4	60	-	50	50	100

Course Content:

Unit I

[Weightage=25% approx., Lectures=15]

Overview of Big Data: Classification of Big Data, Big Data Characteristics, Big Data Types, Traditional Versus Big Data Approach, Technologies Available for Big Data, Infrastructure for Big Data, Use of Data Analytics and Big Data Challenges.

Overview of NoSQL Databases: Types of NoSQL Databases, Characteristics of NoSQL Databases, Traditional Databases Versus NoSQL Databases, ACID and BASE properties.

Unit II

[Weightage=25% approx., Lectures=15]

Hadoop Ecosystem and Data Processing

Overview of Hadoop Ecosystem, Hadoop Core Components, HDFS, MapReduce, YARN, Data Flow in Hadoop, Input and Output in MapReduce and Data Serialization in Hadoop.

HDFS: Overview and Architecture of HDFS, HDFS Shell Commands: File Operations (put, get,

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copy, delete, list), API for HDFS.

Hive and HiveQL: Installing and Configuring Hive, HiveQL Basics: Creating Databases, Tables, Loading Data and Querying Data.

MapReduce and HBase Basics: Mapper, Reducer, Driver, Joins, Subqueries in MapReduce and Basic HBase concepts.

Unit III

[Weightage=25% approx., Lectures=15]

Apache Spark and MongoDB

Introduction to Data Analysis with Spark: Spark Architecture and Components, Downloading, Installing Spark and Programming with RDD, Spark SQL, Spark Streaming.

Introduction to MongoDB: Key Features, Core Server Tools and MongoDB Architecture; MongoDB Installation and Setup; MongoDB JavaScript Shell: Creating Databases, Collections and Documents; Schema Design Principles for Document-Oriented Databases, Indexes in MongoDB; MongoDB Query Language: Filtering, Projection, Sorting, Aggregation.

Unit IV

[Weightage=25% approx., Lectures=15]

Graph Analytics for Big Data and Data Visualization

Apache Spark GraphX: Graph Properties (Vertices, Edges and Attributes), Graph Operators, Triplets and Edge/Vertex Transformations.

Neo4j: Graph Modeling Data with Neo4j; Cypher Query Language: General Clauses, Read and Write Clauses, Indexing and Constraints in Neo4j.

Big Data Visualization: Overview of Big Data Visualization Tools, Techniques and Use Cases.

Text Book:

- Big Data Analytics: Introduction to Hadoop, Spark, and Machine-Learning, 1st Edition, Raj Kamal & Preeti Saxena, McGraw Hill Education.

Reference Books:

- Hadoop: The Definitive Guide, 4th Edition, Tom White, O'Reilly.
- Big Data Analytics: A Hands-On Approach, 1st Edition, Arshdeep Bahga & Vijay Madiseti, VPT Publications.
- Learning Spark: Lightning-Fast Big Data Analysis, Holden Karau, Andy Konwinski, Matei Zaharia, Patrick Wendell, O'Reilly.

Reference Links:

- Overview of NoSQL concepts: <https://www.mongodb.com/nosql-explained>
- Detailed Hadoop guides and references: <https://hadoop.apache.org/docs/>
- Programming guide for Spark GraphX: <https://spark.apache.org/docs/latest/graphx-programming-guide.html>
- Official Cypher reference for Neo4j: <https://neo4j.com/developer/cypher-query-language/>
- Comprehensive Spark reference: <https://spark.apache.org/docs/latest/>
- Guides for MongoDB setup, queries, and administration: <https://www.mongodb.com/docs/manual/>


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B.Sc. CS Semester – VI (Third Year)

Subject Title : Big Data Analytics
Subject Code : CSM305-3C
Subject Type : Major

Course Outcomes (COs)

- **CO1:** Understand the fundamental concepts of Big Data, its characteristics, challenges, and NoSQL database models (Key-Value, Document, Column-Family, Graph).
- **CO2:** Explain and apply the concepts of distributed systems including ACID, BASE, CAP theorem, and data consistency models in real-world database scenarios.
- **CO3:** Demonstrate the architecture and working of Hadoop ecosystem components (HDFS, MapReduce, Hive, HBase) and perform data processing tasks.
- **CO4:** Apply Apache Spark (RDD, Spark SQL, Spark Streaming) for large-scale data analysis and evaluate the use of MongoDB and Neo4j in handling structured, semi-structured, and unstructured data.
- **CO5:** Analyze graph data using Spark GraphX and Neo4j, and develop queries using Cypher language for graph-based applications.
- **CO6:** Visualize Big Data effectively using modern visualization tools such as D3.js, Kibana, and Grafana to support decision-making.

Course Outcome Mapping Table

CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
CO1	Understand the fundamental concepts of Big Data, its characteristics, challenges, and NoSQL database models (Key-Value, Document, Column-Family, Graph).	PO1, PO2, PO3, PSO1	U (Understand)	F, C	10	0
CO2	Explain and apply the concepts of distributed systems including ACID, BASE, CAP theorem, and data consistency models in real-world database scenarios.	PO1, PO2, PO6, PSO1	U, A	C, P	10	0
CO3	Demonstrate the architecture and working of Hadoop	PO1, PO3, PO7, PSO1,	A, An	C, P	10	0


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CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
	ecosystem components (HDFS, MapReduce, Hive, HBase) and perform data processing tasks.	PSO2				
CO4	Apply Apache Spark (RDD, Spark SQL, Spark Streaming) for large-scale data analysis and evaluate the use of MongoDB and Neo4j in handling structured, semi-structured, and unstructured data.	PO1, PO3, PO4, PO7, PSO1, PSO2	A, An, E	C, P	10	0
CO5	Analyze graph data using Spark GraphX and Neo4j, and develop queries using Cypher language for graph-based applications.	PO1, PO2, PO3, PO4, PSO2	An, Cr	C, P	10	0
CO6	Visualize Big Data effectively using modern visualization tools such as D3.js, Kibana, and Grafana to support decision-making.	PO4, PO5, PO7, PO9, PSO2, PSO3	A, Cr	P, M	10	0
Total hour of Instruction					60	00

Mapping of COs with POs & PSOs

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	3	3	0	0	0	0	0	0	0	3	0	0
CO2	3	3	0	0	0	1	0	0	0	0	3	0	0
CO3	3	0	3	0	0	0	3	0	0	0	3	3	0
CO4	3	0	3	3	0	0	3	0	0	0	3	3	0
CO5	3	3	3	3	0	0	0	0	0	0	0	3	0
CO6	0	0	0	3	1	0	3	0	1	0	0	3	1

3: High, 2: Medium, 1: Low


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B.Sc. (CS) Semester – VI (Third Year)

Subject Title : Artificial Intelligence
Subject Code : CSM306-3C
Subject Type : Major

Rationale:

This course introduces students to the theoretical foundations, algorithms, and practical techniques of AI. It emphasizes how machines can be designed to perceive, reason, learn, and act in dynamic environments. Students will explore agent-based problem solving, state-space search strategies, uncertainty handling using utility theory and decision-making under risk. The course also provides an applied perspective on Natural Language Processing (NLP) and Computer Vision, giving students exposure to real-world use cases and hands-on problem solving.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Define Artificial Intelligence and Applications.
- Identify and formulate AI problems and analyze different Agent-Based systems.
- Demonstrate an understanding of search strategies used in AI.
- Understand utility theory and uncertain decision-making.
- Explain the working principles and applications of Natural Language Processing (NLP).
- Understand the fundamentals of Computer Vision and Real-World Applications.

Teaching and Evaluation Scheme:

Credit	Duration in Hours		Maximum Marks		
	Theory	Practical	CCE (Formative)	SEE (Summative)	Total
4	30	60	50	50	100

Course Content:

Unit I [Weightage=25% approx., Lectures=7, Practicals= 14]

Introduction: Artificial Intelligence, Applications of AI, AI Problems, Problem Formulation, Intelligent Agents, Types of Agents, Agent Environments, PEAS Representation of an Agent, Architecture of Intelligent Agents.

Unit II [Weightage=25% approx., Lectures=7, Practicals= 14]

Solving Problems by Searching: Search issues in the design of search programs; Uninformed Search Techniques: Breadth-First Search (BFS), Depth-First Search (DFS); Informed/Heuristic Search Techniques: Generate-and-Test, Hill Climbing, Best-First Search, A*Algorithm.
Adversarial Search: Minimax Algorithm, Alpha-Beta Pruning Algorithm.

Unit III

[Weightage=25% approx., Lectures=8, Practicals= 16]

Knowledge Representation & Reasoning: Reasoning and Logic, Propositional Logic, First-Order Logic, Using First-Order Logic, Inference in First-Order Logic, Forward and Backward Chaining, Resolution.

Uncertain Knowledge and Reasoning: Probabilistic Reasoning, Bayesian Networks, Hidden Markov Models (HMM), Utility Theory.

Unit IV

[Weightage=25% approx., Lectures=8, Practicals= 16]

Natural Language Processing (NLP): Introduction to NLP, Working Principles of NLP, Applications of NLP.

Neural Networks: Introduction to Neural Networks, Neural Network Architectures, Learning Process in Artificial Neural Networks, Types of Artificial Neural Networks, Applications of Artificial Neural Networks.

Computer Vision: Introduction to Computer Vision, Applications of Computer Vision.

Text Books:

- Artificial Intelligence: A Modern Approach, 3rd Edition, Stuart Russell, Peter Norvig, Pearson Education.
- Artificial Intelligence, 3rd Edition, Elaine Rich, Kevin Knight, McGraw-Hill.

Reference Books:

- Artificial Intelligence and Expert Systems, 1st Edition, Dan W. Patterson, Prentice Hall of India.
- Introduction to Artificial Intelligence, E. Charniak, D. McDermott, Pearson Education.

Reference Links:

- Google AI Education - ai.google/education
- TutorialsPoint – Artificial Intelligence (tutorialspoint.com/artificial_intelligence)
- Sanfoundry – sanfoundry.com/artificial-intelligence-mcqs-unification-and-lifting
- **AI Tools and Frameworks:**
 - TensorFlow – Open-source machine learning platform – tensorflow.org
 - Keras – High-level neural networks API – keras.io

Practical List:

- Write a program to implement Breadth-First Search (BFS) for graph traversal.
- Write a program to implement Depth-First Search (DFS) for graph traversal.
- Write a program to implement Tower of Hanoi using recursion and explain state transitions.
- Write a program to solve the 8-Puzzle Problem using suitable search techniques.
- Write a program to solve the Water-Jug Problem using state-space representation.
- Write a program to implement the Monkey–Banana Problem using logical reasoning.
- Write a program to implement a Tic-Tac-Toe Game with winning state analysis.

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- Write a program to solve the Travelling Salesman Problem (TSP) using brute force or heuristic search.
- Write a program to implement Alpha–Beta Pruning on a minimax search tree.
- Write a program to solve the 8-Queens Problem using backtracking and evaluate possible solutions.
- Write a program (or Prolog code) to represent a Genealogical Knowledge Base:
 - Define father relationships.
 - Create rules for brother, cousin, grandson, and descendant relationships.
 - Query the knowledge base to validate relationships.
- Write a program to implement Text Preprocessing including tokenization, stemming, lemmatization and stopword removal.
- Write a program to perform Sentiment Analysis on text data and classify as positive, negative or neutral.

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B.Sc. CS Semester – VI (Third Year)

Subject Title : Artificial Intelligence
Subject Code : CSM306-3C
Subject Type : Major

Course Outcomes (COs)

- **CO1:** Understand the fundamental concepts of Artificial Intelligence, intelligent agents, and their environments.
- **CO2:** Apply various search strategies (uninformed, informed, and adversarial) to solve computational problems effectively.
- **CO3:** Analyze and represent knowledge using propositional and first-order logic, and apply reasoning techniques such as inference, chaining, and resolution.
- **CO4:** Evaluate uncertain knowledge through probabilistic reasoning, Bayesian networks, Hidden Markov Models, and utility theory.
- **CO5:** Explore and implement applications of Natural Language Processing, Neural Networks, and Computer Vision in real-world domains.
- **CO6:** Develop AI-based solutions and practical implementations (search, game playing, NLP, neural networks) with ethical awareness and teamwork skills for real-world problem-solving.

Course Outcome Mapping Table

CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
CO1	Understand the fundamental concepts of Artificial Intelligence, intelligent agents, and their environments.	PO1, PO2, PSO1	U	F, C	7	14
CO2	Apply various search strategies (uninformed, informed, and adversarial) to solve computational problems effectively.	PO3, PO7, PSO2	Ap	P	7	14
CO3	Analyze and represent knowledge using propositional and first-order logic, and apply reasoning techniques such as inference, chaining, and resolution.	PO2, PO6, PSO2	An	C, P	8	16
CO4	Evaluate uncertain knowledge through probabilistic reasoning, Bayesian networks, Hidden Markov Models, and utility	PO3, PO6, PSO2	Evaluate	C, P	8	16


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CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
	theory.					
CO5	Explore and implement applications of Natural Language Processing, Neural Networks, and Computer Vision in real-world domains.	PO4, PO7, PSO1, PSO2	Apply, Analyze	C, P	8	16
CO6	Develop AI-based solutions and practical implementations (search, game playing, NLP, neural networks) with ethical awareness and teamwork skills for real-world problem-solving.	PO5, PO8, PO10, PSO3	Create	P, M	8	16
Total hour of Instruction					30	60

Mapping of COs with POs & PSOs

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	1	3	0	0	0	0	0	0	0	0	3	0	0
CO2	0	0	3	0	0	0	3	0	0	0	0	3	0
CO3	0	3	0	0	0	3	0	0	0	0	0	3	0
CO4	0	0	3	0	0	3	0	0	0	0	0	3	0
CO5	0	0	0	2	0	0	3	0	0	0	3	3	0
CO6	0	0	0	0	2	0	0	2	0	2	0	0	2

3: High, 2: Medium, 1: Low


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B.Sc. (CS) Semester – VI (Third Year)

Subject Title : Content Management Systems
Subject Code : CSE303-3C
Subject Type : Minor

Rationale:

The course Content Management Systems (CMS) equips students with the skills to manage and maintain web content using open-source platforms like WordPress and Drupal. It covers installation, configuration, themes, plugins, modules, user management, security and performance optimization. With a balance of theory and hands-on practice, students gain practical expertise to build and manage professional websites, enhancing their employability in web technologies and digital media.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Understand the Fundamentals of CMS.
- Comprehend CMS Architecture and Components.
- Install and Configure CMS.
- Manage User Roles and Permissions.
- Create and Manage Web Content.
- Utilize Plugins and Extensions.


Teaching and Evaluation Scheme:

Credit	Duration in Hours		Maximum Marks		
	Theory	Practical	CCE (Formative)	SEE (Summative)	Total
4	30	60	50	50	100

Course Content:

Unit I [Weightage=25% approx., Lectures=7, Practicals= 14]
Introduction to Content Management Systems: Definition, Features and Benefits, Comparison of CMS with Static and Dynamic Websites, Types of CMS, Open-Source vs Proprietary CMS, Hosted CMS vs Self-Hosted CMS.
Overview of the WordPress: WordPress History and Evolution; Installation and Configuration: Installing WordPress on Web Server, Configuring the Database and File System.

Unit II [Weightage=25% approx., Lectures=8, Practicals= 16]
WordPress Setup and Administration: Admin Panel, Configuring General Settings, Creating and Managing Posts and Pages, Categories and Tags, Menus and Media Management.


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User Management: Security Settings, Managing User roles like Administrator, Editor, Author, Contributor, Subscriber and Permissions; Role-based Content Management.

WordPress Architecture and Components: Core Architecture: Front-end vs Back-end, Content Storage (Database vs Flat Files), Themes, Plugins, and Modules.

Unit III [Weightage=25% approx., Lectures=7, Practicals= 14]

Drupal Installation and Configuration: Requirements for Drupal Installation, Installing Drupal on Web Server, Configuring the Database and File system, Initial Setup and Configurations.

Admin Panel and Basic Settings: Overview of the Drupal Admin Panel, Configuring General Settings: Site Name, Tagline, Email address etc.

User management: Adding, Editing, and Managing Users; Security Settings: Managing User Roles and Permissions.

Content Creation and Management: Creating and Managing Content: Nodes, Fields and Blocks; Organizing Content with Taxonomy: Categories and Tags.

Media Management: Uploading and Managing Images, Videos and Documents, Content Editing and Customization.

Unit IV [Weightage=25% approx., Lectures=8, Practicals= 16]

Drupal Themes: Installing and Managing Themes.

Modules and Extensions: Introduction of Modules, Importance and Usage, Installing, Activating and Managing Modules, Overview of popular Drupal Modules, Creating and Customizing Menus, Sub-Menus and Links.

Advanced Content Management: Creating and Managing Custom Content Types, Creating and Managing Custom Blocks and Regions; Drupal Views Types.

Text Books:

- WordPress 5 Complete: Build beautiful and feature-rich websites from scratch, 7th Edition, Karol Król, Packt Publishing.
- Drupal For Dummies, 1st Edition, Lynn Beighley, Wiley Publishing.

Reference Books:

- WordPress For Dummies, 9th Edition, Lisa Sabin-Wilson, Wiley Publishing.
- Drupal 10 Masterclass, 1st Edition, Adam Bergstein, Packt Publishing.

Reference Links:

- <https://developer.wordpress.org/reference/>
- https://www.drupal.org/documentation?utm_source=chatgpt.com

Practical List:

WordPress CMS

- Install and Configure a WCMS on Web Server.
- Navigate the WordPress Admin Panel, Understand the Dashboard, and Configure Basic Settings such as Site Title, Tagline, and Time Zone.
- Create and Publish Posts and Pages, Organize Content with Categories and Tags.

- Demonstrate Uploading and Managing Images, Videos, and Documents in the WordPress Media Library and Incorporate Media into Posts and Pages.
- Create Custom Menus, Submenus, and Links, and Manage Navigation to Improve Site Structure and User Experience.
- Learn to Install, Activate, and Customize WordPress Themes using the Theme Customizer.
- Install and Activate Essential Plugins for SEO, Security, Contact Forms, and Other Functionalities, and Enhance Website Functionality with Popular Plugins.
- Create and Manage Custom Widgets to Add Additional Content and Features to the Website's Sidebar and Footer Areas.
- Integrate Social Media sharing buttons and feeds into the WordPress site using Plugins and Widgets.
- Perform Practical Tasks managing different User Roles and Permissions.
- Perform Practical Tasks to create a backup of the Website and Restore it from a Backup.
- Create and Configure a WCMS-Powered Website for a Business or Personal Portfolio.
- Develop a Blog or E-Commerce Site using a WCMS Platform.

Drupal CMS

- Set Up a Local Server Environment for Drupal Development and Download and Install Drupal on the Local Server, Configure the Database, and Complete the Initial Setup.
- Navigate the Drupal Admin Panel, Understand the Dashboard, and Configure Basic Settings such as Site Name, Tagline, and Time Zone.
- Create and Manage Content Types in Drupal, such as Articles, Pages, and Custom Content Types.
- Use Taxonomy to Organize Content with Categories, Tags, and Vocabularies.
- Upload and Manage Images, Videos, and Documents in the Drupal Media Library, and Incorporate Media into Content Types.
- Create and Manage Custom Blocks and Regions to display additional content and features on the Website.
- Install, Activate, and Customize Drupal Themes using the Theme Settings and Customizer.
- Install and activate essential Drupal Modules for various functionalities, such as SEO, Security, and Content Management.
- Add, Edit, and Manage User Roles and Permissions in Drupal.

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 Kadi Sarva Vishwavidyalaya
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B.Sc. CS Semester – VI (Third Year)

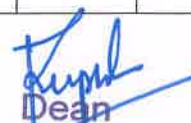
Subject Title : Content Management Systems
Subject Code : CSE303-3C
Subject Type : Minor

Course Outcomes (COs)

- **CO1:** Explain the fundamentals, features, and types of Content Management Systems (CMS) and distinguish between static, dynamic, open-source, and proprietary systems.
- **CO2:** Install, configure, and manage WordPress CMS including settings, user roles, themes, plugins, and content management.
- **CO3:** Demonstrate proficiency in WordPress architecture by creating and organizing posts, pages, categories, media, and managing role-based access.
- **CO4:** Install, configure, and manage Drupal CMS including settings, user management, taxonomy, media, and content creation.
- **CO5:** Customize Drupal themes, templates, modules, menus, and blocks for advanced content management.
- **CO6:** Integrate theoretical knowledge and practical skills to build, deploy, and maintain websites using WordPress and Drupal CMS platforms aligned with industry practices.

Course Outcome Mapping Table

CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
CO1	Explain the fundamentals, features, and types of CMS and distinguish between static, dynamic, open-source, and proprietary systems.	PO1, PO2	U	F, C	7	0
CO2	Install, configure, and manage WordPress (settings, user roles, themes, plugins, content).	PO1, PO3, PO7, PSO1, PSO2	Ap	P	4	14
CO3	Demonstrate WordPress architecture by creating/organizing posts, pages, categories, media, and managing role-based access.	PO1, PO3, PO7, PSO1, PSO2	Ap	P	4	16
CO4	Install, configure, and manage Drupal (settings, user management, taxonomy, media, content).	PO1, PO3, PO7, PSO1, PSO2	Ap	P	7	14


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CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions	Practical Sessions
CO5	Customize Drupal themes, templates, modules, menus, blocks, and Views for advanced content management.	PO1, PO3, PO4, PO7, PSO1, PSO2	C	P	6	16
CO6	Integrate skills to build, deploy, and maintain CMS-based websites (WordPress & Drupal) aligned with industry practices.	PO2, PO3, PO4, PO5, PO7, PSO2, PSO3	C	M	2	0
Total hour of Instruction					30	60

Mapping of COs with POs & PSOs

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	0	0	0	0	0	0
CO2	3	0	3	0	0	0	3	0	0	0	3	3	0
CO3	3	0	3	0	0	0	3	0	0	0	3	3	0
CO4	3	0	3	0	0	0	3	0	0	0	3	3	0
CO5	3	0	3	2	0	0	3	0	0	0	3	3	0
CO6	0	2	3	2	1	0	3	0	0	0	0	3	1

3: High, 2: Medium, 1: Low


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Faculty of Computer Science
Kadi Sarva Vishwavidyalaya
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B.Sc. CS Semester – VI (Third Year)

Subject Title : Communication and Soft Skills for Professional Success
Subject Code : AEC301-3C
Subject Type : AEC

Teaching and Evaluation Scheme:

Subject Code	Subject Title	Teaching Scheme	Credits	Examination Scheme			Total Marks
				Theory Per Week	Hrs.	Max Marks	
		CCE				SEE	
AEC301-3C	Communication and Soft Skills for Professional Success	2	2	2	25	25	50

Course Content

Unit 1: Preparing for the world of work

Teaching Hours: 14 (Weightage 46%)

- Application letter and Cover letter (1 hr)
- Resume crafting-types of layouts
 - Components,
 - Preparing resume based on a relevant job notification (3 hr)
- Group discussion (1 hr)
 - Difference between GD and debate,
 - Importance pf GD,
 - Process of GD, Do's and Don'ts of participating in GD
- Personality traits to be evaluated (2 hr)
 - Dynamics of group behavior/group etiquette and mannerism,
 - Types, opening, summarizing and some tips
- Job interview, Stages& types of Job Interviews (2 hr)
- Preparation, performance and follow- up (Includes some group practice and role play) (3 hr)
- Body language, Do's and Don'ts of body language, Body language in an interview, Negotiation (2 hr)

Unit 2: Professional skills

Teaching Hours: 08 (Weightage 27 %)

- Communication by writing and speaking: Case study, Task Based Expressional Skills check, Overview of written and spoken expressions (2 hr)
- Steps to be followed for written and oral expressions (10 steps) (2 hr)
- Critical thinking: case study, Task Based Expressional Skills check (1 hr)
- Definition, importance, and seven-step plan for critical thinking (1 hr)
- Leadership skills, Trust & Empowerment, Connection & Learning, Leadership & Culture (2 hr)

Unit 3: Basic skills in research and documentation

Teaching Hours: 08 (Weightage 27 %)

- Characteristics of Research, Various data collection tools and techniques (1 hr)
- Proposals (3 hr)
 - Purpose of writing a proposal,
 - Importance and types of Technical Proposals,
 - Structure of a proposal


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Faculty of Computer Science
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B.Sc. CS Semester – VI (Third Year)

Subject Title : Communication and Soft Skills for Professional Success
Subject Code : AEC301-3C
Subject Type : AEC

Course Outcomes (COs)

- **CO1:** Illustrate the skills to enhance employability and apply them for successful participation in trainings, internships, and job interviews.
- **CO2:** Demonstrate the essentials of written and professional communication based in critical thinking and leadership skills
- **CO3:** Discuss fundamental research concepts and identify essential skills for conducting academic research.

Course Outcome Mapping Table

CO No.	Course Outcome (CO)	PO(s) / PSO(s)	CL Cognitive Level	KC Knowledge Category	Class Sessions
CO1	Illustrate the skills to enhance employability and apply them for successful participation in trainings, internships, and job interviews.	PO1, PO2, PO5, PSO3	U, Ap, C	C, P	14
CO2	Demonstrate the essentials of written and professional communication based in critical thinking and leadership skills.	PO1, PO2, PO5, PO8, PSO3	U, Ap, An	C, P	08
CO3	Discuss fundamental research concepts and identify essential skills for conducting academic research.	PO1, PO2, PO4, PO5, PO6, PO7, PSO3	U	C	08
Total hour of instruction					30

Mapping of COs with POs & PSOs

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	3	0	0	3	0	0	0	0	0	0	0	3
CO2	3	3	0	0	3	0	0	2	0	0	0	0	3
CO3	3	3	0	2	3	2	2	0	0	0	0	0	3

3: High, 2: Medium, 1: Low


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Faculty of Computer Science
 Kadi Sarva Vishwavidyalaya
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B.Sc. CS Semester – VI (Third Year)

Subject Title : Internship
Subject Code : SEC351-3C
Subject Type : SEC

Rationale:

This is aimed to provide real practical exposure to students in the actual projects of the industry and various types of other organizations. They need to apply learned concepts, procedures and tools to the project assigned as per the need of the organization. The students should be motivated to deliver the expected output as per the requirement of the project and add-value to the project by applying their skills and knowledge. This is also aimed to fill the gap between the industry and academy.

Learning Outcomes:

The students will be able to:

- Student will learn how real work is carried out in the industry.
- They will learn practically how a real-life project and tasks are executed in the industry.
- They also learn the integration of work with teammate.
- They get platform to know and understand the current Industry requirement.

Teaching and Evaluation Scheme:

Credit	Duration in Hours		Maximum Marks		
	Theory	Practical	CCE (Formative)	SEE (Summative)	Total
4	-	120	50	50	100

Course Content:

It will be counted under Major course and hence Internship can be done in major specific courses only

Minimum 120 hours industrial utility project should be carried out at the organization.

The project work can be related to one or combination of the following types:

- Software Development
- Mobile Application Development
- Software Testing
- Software Maintenance
- ERP - implementation, maintenance, support and customization

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- Database Administration and Support
- System and Network Administration
- System Study, Analysis and Design of major applications
- Multimedia Application Development
- Web-site development with database application
- Data Warehousing, Data Mining
- Data Science, Big Data Analytics
- Application of Software Tools in Research Project/Organization
- Applications/Work related GIS, GPS, RS
- Any industrial utility work in Computer Science / Information Technology and its applications – with prior approval of respective Head of the Institute of B.Sc. CS.

The work carried out on the project should be well-documented, approved & certified by the respective authorities of the organization. Student should present their work done in the project to the examiners during the evaluation of the projects.

Please Note: The Internship Work shall be submitted as an Internship Project Work – VI Presentation / Report / Project Demonstration.


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Faculty of Computer Science
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B.Sc. CS Semester – VI (Third Year)

Subject Title : Internship
 Subject Code : SEC351-3C
 Subject Type : SEC

Course Outcomes (COs)

- CO1: Present professional self-introduction, internship details and organizational overview.
- CO2: Explain internship objectives, alignment with academics and career goals
- CO3: Demonstrate understanding of company profile, organizational structure, tools and technologies.
- CO4: Apply technical knowledge and tools in carrying out project tasks.
- CO5: Develop technical, soft skills and problem-solving ability.
- CO6: Reflect on challenges, contributions, learning outcomes and future career scope.

Course Outcome Mapping Table:

CO No.	Course Outcome (CO)	POs/ PSOs	CL Cognitive Level	KC Knowledge Category	Practical Sessions
CO1	Present professional self-introduction, internship details and organizational overview.	PO1, PO5, PSO3	U	C	10
CO2	Explain internship objectives, alignment with academics and career goals	PO2, PO3, PO5, PSO3	U	C	10
CO3	Demonstrate understanding of company profile, organizational structure, tools and technologies.	PO1, PO6, PO7, PSO1, PSO2	AP	P	20
CO4	Apply technical knowledge and tools in carrying out project tasks.	PO1, PO3, PO7, PSO1, PSO2	AP	P	40
CO5	Develop technical, soft skills and problem-solving ability.	PO3, PO4, PO5, PO7, PSO2, PSO3	AP	P	20
CO6	Reflect on challenges, contributions, learning outcomes and future career scope.	PO2, PO4, PO8, PO10, PSO3	N	M	20
Total hour of Instruction					120

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Mapping of COs with POs & PSOs

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	0	0	0	2	0	0	0	0	0	0	0	3
CO2	0	2	3	0	2	0	0	0	0	0	0	0	3
CO3	3	0	0	0	0	1	3	0	0	0	3	3	0
CO4	3	0	3	0	0	0	3	0	0	0	3	3	0
CO5	0	0	3	2	2	0	3	0	0	0	0	3	3
CO6	0	2	0	2	0	0	0	1	0	1	0	0	3

3: High, 2: Medium, 1: Low


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