

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Advanced Java Programming
Course Code:	15-CAM302-3C
Pre-requisite Course:	Basic Knowledge of Core Java

Course Objective (CO):

This course is intended to make the students:

- To make the students aware of detailed java terminologies such as event handling, GUI programming, database programming using JDBC, etc.
- To make the students develop Web based dynamic applications using Servlets and JSP.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Event Handling : Event Delegation Model or Event Class Hierarchy, Events, Event Sources & Event Listeners. Event Classes : Action Event, Adjustment Event, Component Event, Container Event, Focus Event, Input Event, Item Event, Key Event, Mouse Event, Mouse Wheel Event, Text Event, Window Event. Event Listener Interfaces : Action Listener, Adjustment Listener, Component Listener, Container Listener, Focus Listener, Item Listener, Key Listener, Mouse Listener, Mouse Motion Listener, Mouse Wheel Listener, Text Listener, Window Focus Listener, Window Listener. Adapter Classes, Inner Classes and Anonymous Inner Classes.	10	20
2.	GUI Programming : Introduction to GUI Components, Working with GUI Components (Labels, Buttons, Text Field, Password Field, Text Area, Check Box, Radio Button, List, Scroll Bar, Layout Managers, Menu, etc.), Working with Graphics.	09	20
3.	Introduction to J2EE Platform and Architecture : The J2EE Platform, The J2EE Architecture, J2EE Technologies, Developing J2EE Applications. Database Programming : Introduction to ODBC and JDBC Drivers, Accessing Databases with JDBC, Loading JDBC Driver, Connecting to Database with the java.sql Package, Creating Statements, Executing SQL and Processing Results of a Query, Using Prepared Statement, Using Callable Statement, Using Database Transactions.	10	20
4.	Java Servlets : introduction to Servlets, life cycle of Servlet, basics of the Servlet API, type of Servlet, reading data from a client, reading HTTP request headers, sending data to client and writing the http response header, working with cookies and tracking sessions.	09	20
5.	Java Server Pages (JSP) : introduction to JSP, Life cycle of JSP, JSP directives, JSP implicit objects, JSP Scripting Elements, JSP Actions JSP Expression Language (EL) : Introduction to JSP EL, Operators in EL, JSP EL Implicit Objects.	08	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO. 1 – To handle various types of events.
- CLO. 2 – To develop GUI based applications using GUI components and Graphics.
- CLO. 3 – To develop applications using database connectivity.
- CLO. 4 – To create Web applications using Servlets.
- CLO. 5 – To develop Web based dynamic applications using JSP.

List of Text Book:

1. Marty Hall, Larry Brown, “Core Servlets and JavaServer Pages Volume – 1”, Pearson Education, 2nd Edition. (2004).
2. The Complete Reference JAVA By Herbert Schildt, Tata Mc Grow Hill.

List of Reference Book:

1. Java Servlet & JSP CookBook , Bruce W. Perry , O'Reilly.
2. J2EE: the complete reference , James Edward Keogh , McGraw-Hill
3. Java database programming bible, John O'Donahue, Wiley
4. Java How To Program- Eighth Edition, Paul Deitel & Harvey Deitel, PHI Publication

E-Resource / Web Links:

- <https://www.javatpoint.com/java-swing>
- <https://www.tutorialspoint.com/jdbc/index.htm>
- <https://www.javatpoint.com/servlet-tutorial>
- <https://www.tutorialspoint.com/jsp/index.htm>
- <https://www.tutorialspoint.com/spring/index.htm>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Write a program to demonstrate Component Event.
2. Write a program to demonstrate Focus Event.
3. Write a program to demonstrate Mouse Event.
4. Write a program to implement Mouse Wheel Listener and Mouse Motion Listener.
5. Write a program to demonstrate Window Event.
6. Write a program to implement Labels and Buttons.
7. Write a program to implement Text fields, Text areas and Buttons.
8. Write a program to implement Check boxes.
9. Write a program to implement Radio buttons.
10. Write a program to implement List box.
11. Write a program to implement Scrollbars.
12. Write a program to implement different layout managers.
13. Write a program to implement menu and submenus.
14. Write a program to draw various shapes using Graphics class.
15. Write a program to create database application that uses JDBC driver successfully connected and print proper message like “Connection has been done successfully”.
16. Write a program to create a console application to insert records, retrieve records and display records on the console.
17. Write a program to perform the database operations like insert, update, delete and select for table named - Student. To perform the above operations create below table named – "Student".

Field Name	Field Type
SNo	Integer
Sname	Varchar
SPer	Numeric

18. Write a program to develop a Graphical User Interface (GUI) that performs the SQL operations - (1) Insert (2) Update (3) Delete (d) Select.
19. Write a program that accepts SNo as input from user and display the record of student as per input.
20. Develop Servlet to display “Hello”.

21. Develop Servlet to perform arithmetic calculation.
22. Develop Servlet that demonstrate how the client (browser) can remember the last time it visited a page and displays the duration of time since its last visit. (Hint: use Cookie).
23. Develop Servlet to demonstrate the use of request and response headers.
24. Develop Servlet to authenticate a user based on the login id and password.
25. Develop a JSP page to display message (It may be a simple html page).
26. Develop a JSP page which uses the include directive to show its header and footer.
27. Develop a JSP Page which uses JSP's Page directives & JSP scripting.
28. Develop a JSP Page to display student's personal and result information in tabular format.
29. Develop a JSP Page to perform database driven operations like insert, select, update and delete for table named – Student having fields like SNo, SName, SPer, etc.
30. Develop a JSP Page which uses Session Tracking for online shopping.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1			L	M	M		M	M				M	L		L
CLO2			L	M	M		M	M				M	L		L
CLO3			M	M	M	M	M	M			M	M	M		M
CLO4			H	H	H	H	H	H			H	H	H	M	H
CLO5			H	H	H	H	H	H			H	H	H	M	H

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	System Analysis and Design
Course Code:	15-CAM303-3C
Pre-requisite Course:	-None-

Course Objective (CO):

This course is intended to make the students:

- To aware of various terminology used for system development life cycle.
- To develop different analysis and design techniques in students.
- To design system using various designing tools.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	-	4	50	50	-	-	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Introduction of System: System definition, Element and General Model of System, Characteristics of System, Types of Systems, Types of Users, System Development Strategy (SDLC)	10	20
2.	System Analysis: Role of System Analyst , System Investigation : Fact Finding Techniques , Tools for Documenting Procedures & Decision : Decision Tree, Decision Table	9	20
3.	Code Design: Principles of Code Design, Types of Code Form Design: Types of form, Principles of Form Design, Form Design Steps. Input Design: Data Capture, Steps of Data Capture, Data Validation. Output Design: Objective of Output, Principles of Output Design, Types of Output, Output Considerations	10	20
4.	Data Flow Diagram: Symbols of DFD, Rules for to Draw a DFD, Physical and Logical DFD, Types of DFD (Zero Level DFD, First Level DFD, Second Level DFD), Data Dictionary. System Engineering: Design of Software, Software design and documentation tools: Structure Flowchart, HIPO Chart, Warnier /Orr Diagrams.	10	20
5.	Case Studies : (Input, Output, DFD) : Inventory / Stock System · Library System · Online Shopping System · College Admission and Enrollment System · Student Attendance and Evaluation System	9	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1 : Understand the role of systems analysis within various systems development.
- CLO.2 : Develop an awareness of the different approaches to systems analysis.
- CLO.3 : Understand the systems analyst's activities, and apply current tools and techniques.
- CLO.4 : Learn various systems analysis approaches and explain their strengths and weaknesses.

List of Text Book:

1. System Analysis & Design, 5 th Edition, - S.Parthasarthy & B.W.Khalkar, Master Academy Publication
2. Analysis & Design of Information Systems - James A. Senn Mc Graw Hill

List of Reference Book:

1. System Analysis & Design, 2 nd Edition, Elias M awad, Galgotia Publication
2. Introduction to System Analysis & Design, 3 rd Edition, I.T Hawryszkiewicz3

E-Resource / Web Links:

- https://www.tutorialspoint.com/system_analysis_and_design/index.htm
- <http://www.freetutes.com/systemanalysis/>
- <https://www.geeksforgeeks.org/system-design-tutorial/>

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	H	M	L		H	L		L	M			M	H	L	M
CLO2		L	M	H		M	L	H		M	H	L	M		L
CLO3	H		H		M		M		L		M		L	H	M
CLO4	H	H			M	M	H	L	L		H	M	L	M	

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Software Project Management
Course Code:	15-CAM304-3C
Pre-requisite Course:	Introduction to Programming, Web Development/Software Development Basics

Course Objective (CO):

This course is intended to make the students:

- To understand the fundamental principles of software project management.
- To have a good knowledge of the responsibilities of a project manager.
- To be familiar with the different methods and techniques used for project management.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No.	Topics	Total Hours	Weightage (%)
1.	INTRODUCTION Defining of Software Development Process - Process - Tailoring the Process - Improving the process discipline - Need for implementing discipline. Software Production Process - Identify the Software Model - Software Process Models : Waterfall Model, Prototyping Model, RAD Model, Incremental Model, Spiral Model, Component Assembly Model - Software Life Cycle.	9	20
2.	SOFTWARE DEVELOPMENT Software Development Team - Three Vital Aspects of Software Project Management - The Team - Meaning of Leadership - Communicating in Harmony - Personality traits - Project Organizations. Project Planning: Top-Down and Bottom-Up Planning - Types of Activity - Project Duration : Schedule Monitoring Tools - Gantt Chart, PERT Chart, Critical Path.	9	20
3.	PROJECT REVIEW Tracking Meetings - Recovery plans - Schedule Work & Escalation Meetings. Project Engineering: Product Requirements - Understanding the Customer Problem to solve - Initial Investigation, Strategies for determining information requirements, Information gathering Tools - Product Objectives.	9	20
4.	PROBLEM SOLVING Case-based decision making, Cost estimation problems, risk estimation problems, time estimation problems, Planning and scheduling exercises, Change impact analysis, Risk scenarios with mitigation plans.	9	20
5.	SOFTWARE QUALITY Software Quality - Quality Measures - FURPS - Software Quality Assurance - Software Reviews - Format Technical Review (FTR) Formal Approaches to SQA - Software Reliability - Introduction to SQA - The Software Quality Assurance Plan - Formal approaches to SQA - Clean room Methodology.	9	20

Course Learning Out comes(CLO):

On completion of the course, student will be able to:

- CLO.1 - Apply project management concepts and techniques to an IT project.
- CLO.2 - Identify issues that could lead to IT project success or failure.
- CLO.3 - Explain project management in terms of the software development process.
- CLO.4 - Describe the responsibilities of IT project managers.

List of Text Book:

1. Managing the Software Development Life Cycle" by Marvin E. L.
2. Software Engineering: A Practitioner's Approach" by Roger S. Pressman

List of Reference Book:

1. Software Engineering: A Practitioner's Approach" by Roger S. Pressman
2. Software Project Survival Guide" by Steve McConnell

E-Resource/ Web Links:

- www.agilealliance.org
- www.atlassian.com/software/jira

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List :

1. Introduction to Software Project Management
2. Project Planning and Estimation
3. Software Requirements Gathering and Analysis
4. Work Breakdown Structure (WBS)
5. Scheduling and Resource Allocation
6. Risk Management in Software Projects
7. Cost Estimation and Budgeting
8. Quality Assurance and Control
9. Team Formation and Management
10. Communication Management
11. Agile Methodologies (Scrum, Kanban, etc.)
12. Project Tracking and Monitoring
13. Version Control and Configuration Management
14. Project Documentation and Reporting
15. Project Closure and Post-Mortem Analysis
16. Software Project Metrics and Performance Evaluation
17. Change Management in Software Projects
18. Stakeholder Management and Client Communication
19. Conflict Resolution in Software Teams
20. Tools for Software Project Management (Jira, Trello, MS Project)
21. Software Development Life Cycle (SDLC) and Project Methodologies
22. Ethics and Legal Considerations in Software Project Management

These topics cover a wide range of practical skills and tools for managing software projects from initiation to closure.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	L	L	L	M	L	L	M	L	L	L	L	M			
CLO2	M	L	L	L	M	L	L		M	L	L	L			
CLO3	L	M	H	H	L	M	L	H	L	L	M	L			
CLO4	M	L	L	M	L	L	M	L	M	L	H	H			
CLO5															
CLO6															

H:High, M:Medium, L:Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Web Development using PHP
Course Code:	15-CAE305-3C
Pre-requisite Course:	Basic understanding of HTML, CSS, and programming concepts

Course Objective (CO):

This course is intended to make the students:

- To understand fundamentals of Open Source, Server Side Programming Technology PHP.
- To learn exception handling, cookie and session management.
- To develop websites using open source technology PHP and MySQL.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Introduction of Open Source: Introduction to Open Source, Pros and cons of Open Source, Features of Open Source, Introduction to different open source software (Linux, ERP, CMS). PHP Basics: History of PHP, Features of PHP, Basic Syntax of PHP, Creating & Running PHP Webpage, Data Types, Comments, Defining Variables and Constants, Operators and Expressions, Scope of Variables (local, global, static), Type Casting, including files using include() and require().	09	20
2.	Control Structures: Conditional Statements (If and Switch) Looping Statements (While, For, Do... While, For Each). Working With Array: Creating and using Arrays, Types of an Array (Indexed and Associative Arrays). Working With PHP Functions: User Defined Functions, Variable Functions, Array Functions, and String Functions.	09	20
3.	Object Oriented Programming With PHP: Creating Class and Objects, Accessing Class Members, Visibility of Class Members (Private, Public, Protected), working with Constructors and Destructors. Inheritance: Introduction of Inheritance, Types of Inheritance. Error and Exception Handling: Types of Errors, Error Handling, Creating Custom Error handler, Exception Handling using Try, Catch and Throw, Creating Custom Exception handler.	10	20
4.	Working With Forms: Creating and Handling HTML Form elements, Sending form data using GET and POST Methods, Receiving Form data using \$_GET, \$_POST and \$_REQUEST variables, Use of Hidden Field, Validating Form Data, Redirecting User, File Uploading, Sending mail. State Management: Working With Cookies: Introduction of Cookie, Setting and Accessing a Cookie, Destroying a Cookie. Working With Session: Introduction of Session, Starting a Session, Use of Session Variable, Destroying Session.	10	20

5.	Database Connectivity With MySQL : Introduction to MySQL and MySQLi, MySQL Data Types, Connection with MySQL Database, Database Manipulation (INSERT, SELECT, UPDATE, DELETE), MySQLi Functions.	10	20
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Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1 - To have fundamental knowledge of Open Source Web Technology PHP.
- CLO.2 - To work with PHP functions.
- CLO.3 - To understand the basics of object oriented programming and event handling.
- CLO.4 - To develop web applications using cookie and session.
- CLO.5 - To develop database driven Web applications.

List Text Book:

1. The Complete Reference PHP, By Steven Holzner, Tata Mcgraw Hill Education Private Limited
2. Teach Yourself PHP, MySQL and Apache All in One ,By Julie C. Meloni, Pearson Education.

List of Reference Book:

1. PHP 5 and MySQL Bible publication
2. Beginning PHP and MySQL From Novice to Professional, By W. Jason Gilmore, Apress.
3. PHP 5 and MySQL Bible, By Tim Converse and Joyce Park with Clark Morgan, Wiley Publishing, Inc.
4. Learning PHP, MySQL, JavaScript, and CSS, By Robin Nixon, O'Reilly Publication Media.

E-S ource / Web Links:

- <https://www.w3schools.com/php/>
- <https://www.tutorialspoint.com/php/>
- <http://php.net/manual/en/manual.php>
- <https://www.javatpoint.com/php-tutorial>
- <https://www.w3resource.com/php/php-home.php>
- <https://www.guru99.com/php-tutorials.html>
- <https://www.tutorialrepublic.com/php-tutorial/>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Write a script to display "My First PHP Script" Message.
2. Write a script to perform arithmetic operations.
3. Write a script to demonstrate constant.
4. Write a script to demonstrate the use of indexed arrays and associative arrays.
5. Write a script to demonstrate the use of array functions.
6. Write a script to demonstrate the use of string function.
7. Write a script to demonstrate the use of constructor and destructor.
8. Write a script to implement the concept of inheritance.
9. Write a script to create a simple student registration form.
10. Write a script to create a simple calculator using form.
11. Write a script to prepare a student mark sheet using form.
12. Write a script to validate form data.
13. Write a script to redirect users.
14. Write a script to upload a file.

15. Write a script to send mail.
16. Write a script to demonstrate the use of session.
17. Write a script to demonstrate the use of cookies.
18. Write a script to implement custom error handling.
19. Write a script to demonstrate exception handling using try, catch and throw.
20. Write a script to create a new database.
21. Write a script to create a new table in the database.
22. Write a script to insert records to the table in the database.
23. Write a script to retrieve all records from the table in the database.
24. Write a script to delete and search record from the table in database
25. Write a script to update records to the table in the database.
26. Write a script to implement following tasks:
 - Registration & Login of user.
 - Modify the details of user.
 - Logout.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1			L	M	M		M	M				M	L		L
CLO2			L	M	M		M	M				M	L		L
CLO3			M	M	M	M	M	M			M	M	M		M
CLO4			H	H	H	H	H	H			H	H	H	M	H
CLO5			H	H	H	H	H	H			H	H	H	M	H

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application(BCA)
Program Code:	CS101
CourseTitle:	Windows Server Security
Course Code:	15-CAE306-3C
Pre-requisite Course:	Basic understanding of networking and operating systems

Course Objective (CO):

This course is intended to make the students:

- Understand the fundamental concepts of Windows Server architecture and security principles.
- Learn the installation, configuration, and management of Windows Server for secure operations.
- Develop the ability to identify and mitigate security risks in a Windows Server environment.
- Gain hands-on experience with tools and techniques to secure Windows Servers.
- Demonstrate the ability to implement and manage advanced security features like Active Directory and Group Policies.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Unit 1: Introduction to Windows Server Security • Overview of Windows Server • Understanding security fundamentals • Common threats to Windows Server environments • Overview of server roles and their security aspects	6	15%
2.	Unit 2: Installation and Configuration of Windows Server • Installing Windows Server • Initial server configuration • Overview of Server Manager • Securing the server post-installation	6	15%
3.	Unit 3: User and Group Management • Creating and managing user accounts • Configuring group accounts and permissions • Introduction to Active Directory • Secure access control using roles and permissions	8	20%
4.	Unit 4: Network and Data Security • Configuring firewalls and Windows Defender • Implementing secure network protocols • Introduction to IPsec and VPNs • Data encryption using BitLocker • Secure file-sharing and NTFS permissions • Managing backups and disaster recovery	10	25%

5.	Unit 5: Monitoring, Auditing, and Advanced Security - Managing Event Viewer and security logs - Configuring auditing policies - Introduction to monitoring tools (e.g., Windows Admin Center) - Group Policy Management for advanced security - Configuring SSL/TLS for secure communications - Managing certificates and PKI	10	25%
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Course Learning Outcomes(CLO):

At the end of this course, the student would be able

- **CLO1:** Describe the role of Windows Servers in IT infrastructure and explain core security challenges.
- **CLO2:** Configure secure user accounts, permissions, and roles using Windows Server tools.
- **CLO3:** Implement network and data security using built-in Windows Server features.
- **CLO4:** Securely manage and monitor Windows Server logs and services.
- **CLO5:** Deploy advanced security policies, including encryption, auditing, and updates.

List of Text Book:

1. Windows Server Administration Fundamentals ,Microsoft Official Academic Course, Wiley
2. Mastering Windows Server 2022, Jordan Krause, Packt Publishing
3. Windows Server 2019 Inside Out,Orin Thomas, Microsoft Press

List of Reference Book:

1. Windows Group Policy: Fundamentals, Security, and the Managed Desktop,Jeremy Moskowitz,Sybex
2. Windows Server Security Essentials, Darril Gibson ,Sybex
3. Microsoft Windows Security Secrets and Solutions, Joel Scambray, Stuart McClure, and George Kurtz, McGraw-Hill Education

E-Resource/WebLinks:

- <https://learn.microsoft.com/en-us/training/windows-server/>
- <https://learn.microsoft.com/en-us/windows-server/security/>
- <https://www.coursera.org/learn/windows-server-management-security>
- <https://github.com/topics/windows-server-security>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical list:

1. Install Windows Server, configure basic settings, and secure it using Server Manager.
2. Create users and groups and configure access controls.
3. Deploy and configure Active Directory for centralized user management.
4. Configure firewalls, enable IPsec, and set up VPN connections.
5. Implement BitLocker to encrypt a drive and secure files.
6. Configure NTFS permissions for shared folders.
7. Analyze Event Viewer logs and configure audit policies.
8. Create and apply Group Policies for password policies and system security.
9. Secure server communications using certificates.
10. Develop a disaster recovery plan using backup tools.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	H	M	H	M			M		M				H	M	
CLO2		H		H		H	H			H			H	M	M
CLO3		M		H		H	H	H					H	H	H
CLO4			H			H		H	H	H				H	M
CLO5	H	M	H	H		H	H	H	H		H		H	H	H

H:High, M:Medium, L:Low

Branch Name:	Bachelor Of Computer Application (BCA)
Program Code:	CS101
Course Name:	Cloud Administrator - I
Course Code:	15-CAE307-3C
Pre-requisite Course:	Basic knowledge of Computer Networks and Network protocol suits, process and thread management

Course Objectives:

- Basics of cloud computing.
- Key concepts of virtualization.
- Different Cloud Computing services.
- Cloud Implementation and its tools.
- Key components of Amazon Web Services.
- Cloud Backup and solutions.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Fundamentals of Cloud Computing Introduction to Cloud Computing : Definition, evolution, and importance of cloud computing, Characteristics of cloud computing: On-demand, scalability, elasticity Cloud Service Models : Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS) Cloud Deployment Models : Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud Virtualization Basics : Virtual machines, hypervisors, Comparison of virtualization and containerization (Docker basics) Cloud Service Providers : Overview of AWS, Azure, Google Cloud, IBM Cloud, Comparison of services offered by providers	10	20
2.	Cloud Infrastructure and Operations Compute Services : Virtual Machines (VMs) and Instances, Introduction to serverless computing (AWS Lambda, Azure Functions) Storage Services : Virtual Private Cloud (VPC) basics, Subnets, gateways, and firewalls, Load balancing and auto-scaling Cloud Databases : Introduction to SQL and No SQL databases, Managed databases: AWS RDS, Azure SQL, Google Cloud Spanner Hands-on Practice : Setting up virtual machines and storage, Configuring basic networking in the cloud	10	20

3.	Cloud Security and Identity Management : Cloud Security Basics : Importance of security in the cloud, Data encryption at rest and in transit Identity and Access Management (IAM) : Creating user roles and policies, Multi-factor authentication (MFA) Compliance and Governance : Overview of compliance standards (GDPR, ISO 27001), Monitoring and auditing cloud activities Backup and Disaster Recovery : Importance of data backup, Implementing disaster recovery strategies Hands-on Practice : Configuring IAM policies, Implementing security groups and firewalls	10	20
4.	Handling Web Requests: The App Engine Architecture, Configuring the Frontend , How App Runs, Quotas and Limits DataStoreEntities: Entities,keysandProperties,DataStoreAPI,Propertyvalues, Keys and Key Objects, Using Entities, Persistence API : Setting Up JPA , Entities and Keys , Entity Properties , Embedded Objects , Saving, Fetching, and Deleting Objects , Transactions in JPA , Queries and JPQL Relationships	09	20
5.	Cloud Service Providers ; EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue Service, Microsoft Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM Smart Cloud. Security in Cloud Computing, Cloud General Challenges,	09	20

Course Learning Outcomes (CLO) :

At the end of this course, the student would be able :

- CLO.1: Define Cloud Computing and memorize the different Cloud service and deployment models
- CLO.2: Describe the importance of virtualization along with their technologies.
- CLO.3: Use and Examine different cloud computing services.
- CLO.4 : Analyze the components of Google Cloud platform.

List of Textbooks:

1. John W. Rittinghous, James F. Ransome, —Cloud Computing : Implementation, Management and Security, CRC Press 2010.
2. Cloud Computing-A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter. Mc Graw Hill.
3. Michael Miller, —Cloud computing–Web based applications that change the way you work and collaborate online, Pearson Education Inc., 2008

List of Reference Books:

1. Rishabh Sharma: Cloud Computing Fundamentals, Industry Approach and Trends: Wiley Publication. (ISBN: 978-81-265-5306-8)
2. Kailash Jayaswal, Jagannath Kallakurchi, Donald J. Houde, Dr. Deven Shah : Cloud Computing: Black Book Dr eamtech Publications (ISBN 978-93-5119-418-7)
3. Dan Sanderson : Programming Google App Engine : O'Reilly | Google Press: (ISBN-978-0-596-52272-8)
4. Cloud Computing: A practical approach by Anthony T. Vetle–Tata Mc Graw Hill Education Private Limited (2009)
5. Rajkumar Buyya, Christian Vechhiola, S. Thamarai Selvi, “Mastering Cloud Computing “, Mc Graw Hill Education (India) Private Limited.

E-Resources/ WebLinks:

- <https://www.simplilearn.com/https://aws.amazon.com/https://www.javatpoint.com/cloud-computing-tutorial>
- <https://www.coursera.org/learn/cloud-computing-basics>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirements.

Practical List:

1. Setting up a Virtual Machine. (Log in to a cloud platform)
2. Managing Storage Services. (Set permissions to make the file public.)
3. Configuring a Database in the Cloud. (Choose a database engine (MySQL, PostgreSQL, or SQL Server))
4. Deploying a Static Website. (Access the website using the bucket's endpoint URL.)
5. Monitoring and Alerts. (Launch a VM instance and enable monitoring - e.g., Cloud Watch for AWS, Monitor for Azure)

Mapping of CLO with PO & PSO:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	H	M	L	M	L				L		M	M	H	M	
CLO2	H	L	M	H	H				M		L	L	L	M	
CLO3	M	L	L	M	L				L		M	L	L	L	
CLO4	L	M	M	M	L				M		M	M	L	M	

H:High, M:Medium, L:Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Web .NET with C#
Course Code:	15-CAE308-3C
Pre-requisite Course:	Basic Knowledge of Design and Development of Web Applications

Course Objective (CO):

This course is intended to make the students:

- This course is intended to make the students aware of Understand ASP.Net architecture, lifecycle, and server controls.
- Learn C# programming and web-based application concepts.
- Explore ASP.Net controls for interactive interfaces and validations.
- The goal of Course expertise in ADO.Net and three-tier web application development.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Introduction to ASP.Net: Introduction and Features of .Net, .Net Framework architecture (CLR, MSIL, JIT, FCL, WPF, WCF, LINQ, CLS, CTS), .Net Languages. Working With Asp.Net: Introduction to Web-Form and its events, Asp.net Application Life Cycle, ASP.net Page Life Cycle, ASP.Net Server Control Events, IIS Server	10	20
2.	Introduction to C# : Introduction to C#, Data type, Looping statement, For each Loop, Array, Function, Delegate Basic about Classes & Objects: Namespaces and Assemblies. Introduction to Web Server, Web Based vs. Window Based Application	9	20
3.	Working with ASP.Net Standard Controls: Label, Textbox, Button, Link Button, Image Button, Hyperlink, List Box, Dropdown List, Checkbox, Checkbox List, Radio Button, RadioButtonList, BulletedList, Image, Table, Panel, File Upload.	9	20
4.	Validation Control: Required Field Validator, Range Validator, Regular Expression Validator, Compare Validator, Custom Validator, Validation Summary. Rich Controls: Calendar Control, Ad Rotator Control, Multitier Control. Navigation Control: Menu Control, Tree View Control, Site Map Path Control. Mater page and Theme	10	20
5.	Introduction of ADO.Net : ADO.net Architecture (Data Set, Data Provider, Data Object, Data Adapter), Data Reader vs. Data Set, ADO vs. ADO.Net, Data Binding - Single value Data Binding, Repeated Value Data Binding, Three tiers of Web Applications.	9	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- **CLO 1:** Understand .NET Framework features, architecture, and languages.
- **CLO 2:** Work with ASP.NET Web Forms, lifecycle, and IIS configuration.
- **CLO 3:** Learn C# basics (data types, loops, functions, OOP concepts).
- **CLO 4:** Differentiate between web-based and window-based applications and web server functionality.
- **CLO 5:** Use ASP.NET standard controls to create interactive web apps.
- **CLO 6:** Implement validation controls, rich controls, navigation systems, data controls, and use Master Pages and Themes.

List of Text Book:

1. The Beginning Asp.net 4 in c# 2010 - APRESS.
2. The Complete Reference ASP.NET - TATA McGraw-Hill.
3. ASP.NET Black Book.

List of Reference Book:

1. "Pro ASP.Net Core MVC 2" by Adam Freeman
2. "C# 9 and .NET 5 – Modern Cross-Platform Development" by Mark J. Price
3. "Professional ASP.Net 4.5 in C# and VB" by Jason N. Gaylord, Christian Went
4. Microsoft ASP.Net – Nora Prakashan / Shyam N. Chavada

E-Resource /Web Links:

- <https://www.w3schools.com/asp/>
- <http://www.tutorialspoint.com/listtutorials/asp-dot-net/1>
- http://www.pragimtech.com/dot_net_tutorials_for_beginners.aspx

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change / formulate it as per his/her methodology and requirement.

Practical List:

1. Write a program to print "HELLO COMPUTER" on web form.
2. Write a program to set a link for new Page.
3. Write a program using delegate in which addition and subtraction of two Integer value Possible.
4. Write a program using while or for loop to print sum of first 100 ODD and Even Numbers.
5. Write a program using for each loop.
6. Write a program to Create Simple Web Application using two or more web form.
7. Write a program to demonstrate different common Control.
8. Write a program to add the value of Text Box in to Dropdown List and List box Controls.
9. Write a program to Delete Items from Dropdown list and List box.
10. Write a program to set Image on Image Control according to selection of image name
From dropdown list.
11. Write a program which demonstrates the Validation Control.
12. Write a program which is using different Rich Control.
13. Write a program using Menu Control.
14. Write a program using Tree View Control.
15. Write a program using Sitemap Control.
16. Write a program to demonstrate use of Master Page and Theme.
17. Write a program to perform insert and update operation in Database.
18. Write a program to perform delete and search operation in Database.
19. Write a program to display the records from database using Data Reader Object.
20. Write a program to demonstrate the various methods of Dataset Object.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	L	H			H	H	M		M	L			M		H
CLO2			M	H		L	M		H					M	
CLO3		M	L	H	H	M		L	L						M
CLO4	L	L			M	M		L	M					M	
CLO5		L	M			H		M	L				M		H
CLO6	L	H	M	H	M	M	H	H	H	H	H	M	H	H	M

H: High, M: Medium, L: Low

Branch Name:	Bachelor Of Computer Application (BCA)
Program Code:	CS101
Course Title:	Linux Server Security
Course Code:	15-CAE309-3C
Pre-requisite Course:	Basic Knowledge of Operating System

Course Objective (CO):

This course is intended to make the students:

- Apply a range of security techniques to secure a Linux server environment.
- Manage user access and authentication securely while preventing unauthorized access.
- Use industry-standard security tools to monitor, detect, and respond to security threats.
- Implement best practices for network and application security on Linux servers.
- Understand and implement secure configurations in virtualized and cloud environments.
- Perform security audits, penetration testing, and continuous monitoring to maintain a secure Linux server environment.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Introduction to Linux Security Linux introduction : file system Basic Features, Different flavors of Linux. Advantages, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons - cmp & comm, View files, disk related commands, checking disk free spaces..	8	15
2.	Linux System Hardening Understanding shells, Processes in linux, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi & vim editor. Simple filter commands - pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions - grep, egrep, and sed.	8	15
3.	Introduction to Shell Programming- develop some shell programs. System administration: Common administrative tasks, configuration and log files, Role of system administrator. Installing requirement, Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process.	9	18

4.	Managing user accounts-adding & deleting users : changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, file security & Permissions, becoming super user using su. host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages. Starting & Using KDE & Gnome graphical interfaces. Basic networking administration: Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to Internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services. Automating backups with cron.	10	20
5.	Installation, configuration & Administration of following servers in Linux Mail server DNS Remote access ftp server Apache web server Vnc Server	4	15

Course Learning Outcomes(CLO):

At the end of this course, the student would be able

- CLO.1: Fully understand the fundamental concepts of Linux server administration,
- CLO.2: Put those concepts to use in real-world situations.
- CLO.3: Install and customize Linux (administration of Linux servers from the GUI);
- CLO.4: Manage users, permissions, folders, and native applications;

List of Text Book:

1. "Linux Administration: A Beginner's Guide" by Wale Soyinka.
2. Fedora 9 And Red Hat Enterprise Linux Bible by Christopher Negus, Wiley India Ltd.
3. Linux Bible, 9ed, by Christopher Negus, Wiley India Ltd

List of Reference Book:

1. "Linux Security Cookbook" by Daniel J. Barrett, Richard E. Silverman.
2. "Practical Linux Security Cookbook" by Tajinder Kalsi.
3. "Linux Administration: A Beginner's Guide" by Wale Soyinka.

E-|RE source /Web Links:

- <https://www.redhat.com/en/services/training/rh415-red-hat-security-linux-physical-virtual-and-cloud>
- <https://training.linuxfoundation.org/resources/free-courses/>

List of Experiments:

Note : The experiment list provided beneath this for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Practical 1: Understand and modify file and directory permissions using chmod, chown, and chgrp.
2. Add, modify, and delete users and groups.
3. Set up SSH key-based authentication.
4. Configure basic iptables rules to allow or block specific traffic.
5. Set up and test rules using firewalld.
6. Analyze system logs in /var/log.
7. Install and configure Tripwire.
8. Encrypt files using GPG.
9. Restore data from a backup.
10. Use nmap to perform a basic network vulnerability scan.
11. Configure HTTPS on a web server (Apache or Nginx).

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1			L	M	M	L	L		M					L	
CLO2		M	L	H	M	L	L	L					M		
CLO3	L	M		M	M	M			M					M	
CLO4	L	L		M	M	M	L		L					L	

H:High, M:Medium, L:Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Intranet Network Monitoring & Security
Course Code:	15-CAE310-3C
Pre-requisite Course:	Fundamentals of Computer Networks

Course Objective (CO):

This course is intended to make the students:

- To understand the core concepts of network security, including the principles of confidentiality, integrity, availability (CIA), and the authentication, authorization, and accounting (AAA) models..
- To explore the different types of security protocols and their importance in protecting network data, including cryptography, IP security, and network security tools.
- To learn the methods and tools used for network security assessment, including passive and active information gathering, port scanning, and intrusion detection systems.
- To understand wireless network security, its threats, vulnerabilities, and effective countermeasures to protect wireless communications.
- To develop hands-on skills in configuring, monitoring, and securing a network, using tools like Snort (IDS), Nmap, and Wireshark for network analysis and troubleshooting.
- To apply knowledge in real-world scenarios to design secure networks, implement firewalls, VPNs, and intrusion detection systems, and respond to network threats effectively.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Sr. No.	Topics	Total Hours	Weightage (%)
1.	Introduction to Network Security & Cyber Security Concepts: Network Security and its need, CIA (Confidentiality, Integrity, Availability), AAA (Authentication, Authorization, Accounting), Network Devices (Host, Router, Switch, Bridge, etc..) on Each Layer of OSI Model, Working of DNS, DHCP, IDS (Intrusion Detection System), IPS (Intrusion Prevention System), Firewall and its types, Web Proxies, Internet Security Protocols	9	20
2.	Introduction to Cryptography & IP Security: Key Terms: Encryption, Decryption, Plain Text, Cipher Text, Secret Code, Types of Cryptographic Functions, Secret Key Cryptography, Public Key Cryptography, Hashing, Hash Algorithms, Digital Signatures, IP Security Architecture – Authentication Header, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange (IKE).	9	20
3.	Network Security Assessment - 1: Passive Information Gathering: IP Address & Domain Identification, Banner Grabbing (Ncat, Telnet & other tools), Identifying Domain Ownership (WHOIS, DNS Lookup & other tools), Active Information Gathering: Detecting Active Systems, ICMP Ping, Port Scanning and its techniques, Port Scanning Tools (Nmap, Zenmap, Superscan & other tools), OS Fingerprinting – Active & Passive.	8	20

4.	Network Security Assessment - 2: Physical Interception, Traffic Capturing Tools (Wireshark), Packet Analysis, Protocol Analysis, Traffic Timeline Analysis, Setting up your own Network Intrusion Detection System (SNORT-NIDS).	8	20
5.	Wireless Security: Wi-Fi basics – Wireless Clients and NICs, Wireless Access Points (WAP), Wireless Communication Standards, Wi-Fi Security – 802.1x Authentication, Wireless LAN Threats – Wardriving (NetStumbler, Kismet), Eavesdropping, Rogue and Unauthorized Access Points, Evil Twin Attack, DOS, WLAN Encryption Flaws: Cracking WPA/WPA2 PSK, Decrypting WEP and WPA Packets, ARP poisoning and MAC spoofing, Security Wireless Security.	9	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1 : Understand and apply fundamental concepts of network security, such as CIA and AAA models.
- CLO.2 : Demonstrate proficiency in cryptographic techniques and IP security protocols
- CLO.3 : Perform network security assessments, including information gathering, scanning, and fingerprinting
- CLO.4 : Implement intrusion detection systems and conduct packet analysis using tools like Wireshark and Snort.
- CLO.5 : Secure wireless networks and mitigate common vulnerabilities associated with wireless communication.
- CLO.6 : Design and configure network security defenses, including firewalls, VPNs, and intrusion detection systems

List of Text Book:

- Network Security Essentials by William Stallings
- Cryptography and Network Security by William Stallings

List of Reference Book:

- The Web Application Hacker's Handbook by Dafydd Stuttard and Marcus Pinto
- Network Security, Private Communication in a Public World by Charlie Kaufman, Radia Perlman, and Mike Speciner

E-Resource / Web Links:

- <https://www.wireshark.org/docs/>
- <https://nmap.org/book/>
- <https://www.snort.org/>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. To study various wired & wireless network devices based on layers of OSI Model.
2. To study various attacks based on layers of OSI Model.
3. To perform following operations using Netcat: Port Scanning & Port Listening Banner Grabbing File/Data Transfer Chat Server
4. Study the use of network reconnaissance tools like dig, traceroute, nslookup to gather information about networks and domain registrars.
5. To perform Open Source Intelligence (OSINT) about any specific domain. (WHOIS, DNS Lookup & other Tools)

- A Passive Information Gathering Technique.
- 6. To perform port scanning using various methods & techniques provided by Nmap or Zenmap.
- 7. To implement a packet capturing tool (Wireshark) and capture the real time traffic.
- 8. To study & analyse the captured packets for different protocols & search queries using Wireshark.
- 9. Observe performance in promiscuous as well as non-promiscuous mode in Wireshark and also show that packets can be traced based on different filters.
- 10. Use the Nessus tool to scan the network for vulnerabilities.
- 11. To implement/configure Intrusion Detection System for Log Collection based on default & customized rules. (Ex. Snort IDS)
- 12. To study the features of firewall in providing Network Security and policy implementation on any basic firewall.
- 13. To implement a whitelisting & blacklisting policy in the firewall.
- 14. To study ARP Protocol & perform ARP poisoning attack.
- 15. To study WEP, WPA2PSK and perform WEP, WPA cracking.
- 16. To study and report on the latest Network Security Crimes, Network Security Challenges and Solutions to overcome them.
- 17. To Implement Caesar cipher encryption-decryption & Playfair cipher encryption-decryption.
- 18. To write a program to generate SHA-1 hash & to implement a digital signature algorithm.
- 19. To perform various encryption-decryption techniques with cryptool. Techniques like caesar cipher, Monoalphabetic cipher, polyalphabetic cipher, rectangular cipher, columnar cipher, Hill cipher etc.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	H	M	L	H	L	M	L	M	H	M	L	M	H	M	L
CLO2	M	H	H	M	H	L	H	M	L	H	M	L	M	H	H
CLO3	L	L	H	L	M	H	M	L	M	H	H	M	H	M	H
CLO4	H	M	M	H	L	M	H	H	L	M	L	H	M	L	H
CLO5	M	H	L	M	H	L	M	M	H	M	H	L	H	H	M
CLO6	L	L	H	M	L	H	M	L	M	H	M	H	L	H	H

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Open Cart with Woo Commerce
Course Code:	15-SEC113-3C
Pre-requisite Course:	Basic Knowledge of E-commerce

Course Objective(CO):

This course is intended to make the students:

- Understand e-commerce and online store management.
- Set up, configure, and manage online stores using OpenCart and WooCommerce.
- Customize and extend functionality via themes and extensions/plugins.
- Compare features, strengths, and weaknesses of both.
- Develop practical skills through hands-on projects.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
-	-	4	2	-	-	25	25	50

Course Contents:

Sr. No.	Topics	Total Hours	Weightage (%)
1.	Introduction to E-Commerce Platforms What is E-commerce? Types (B2B, B2C, C2C). Key online store components: product catalog, shopping cart, checkout, payments, shipping. Content Management Systems (CMS) in e-commerce. Open Cart and Woo Commerce overview: history, features, market share.	10	20
2.	Open Cart Fundamentals Install and set up Open Cart. Understand the admin interface: dashboard, catalog, sales, settings. Create categories, products, and attributes. Set up payment gateways and shipping. Manage orders, customers, and reports.	8	20
3.	Woo Commerce Fundamentals Install WordPress and Woo Commerce. Understand the Woo Commerce interface: products, orders, customers, settings. Create products (simple, variable, grouped). Configure shipping zones, methods, taxes. Set up payment gateways and manage orders.	8	20
4	Open Cart Customization: Work with themes: install, customize, basic theme development. Extend functionality with extensions/modules. Understand template structure and basic PHP/HTML for customization. Woo Commerce Customization: Work with WordPress themes and their impact on Woo Commerce. Customize with plugins and code snippets. Understand templates and basic PHP/HTML for customization.	10	20
5.	Open Cart vs. Woo Commerce : Compare features, strengths, weaknesses. Performance, scalability, and security. Ease of use, learning curve, and support. Choose the right platform	10	20

Course Learning Outcomes(CLO):

At the end of this course, the student would be able :

- CLO.1: Understand E-Commerce Platforms
- CLO.2: Install and Configure E-Commerce Platforms
- CLO.3: Design and Customize Online Stores
- CLO.4: Manage Products and Inventory
- CLO.5: Manage Customers and Marketing

List of Text Book:

1. Mastering Open Cart 3: Create and Customize Online Stores" by **Murat Yilmaz**
2. Woo Commerce Explained: Your Step-by-Step Guide to Woo Commerce" by **Stephen Burge**
3. Woo Commerce for Beginners" by **Brian Messenlehner and Jason Coleman**

List of Reference Book:

1. E-Commerce Essentials: Building Online Stores" by **Susan Coleman**
2. WordPress All-in-One For Dummies" by **Lisa Sabin-Wilson**
3. E-Commerce with Open Source Platforms" by **David Huber**

E-Resource/WebLinks:

- Open Cart: <https://docs.opencart.com/>
- Woo Commerce: <https://woocommerce.com/documentation/>

List of Experiments:

Note:The experiment list provided below for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Analyze successful e-commerce sites and identify key features.
2. Set up a basic Open Cart store with sample products, configure payment and shipping, process test orders.
3. Customize a theme, install extensions, make minor code changes.
4. Set up a Woo Commerce store with various product types; configure shipping and taxes, process test orders.
5. Customize a WordPress theme for Woo Commerce, install plugins, make minor code changes.
6. Analyze case studies of businesses using each platform.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	H	M	M			M	M		H	M			H	M	M
CLO2	H	H		H	H		M		M		M		H	M	M
CLO3	M	H	H	H	H	M		M	H	H	M	H	H	H	H
CLO4	H		M	M	M		M	H	M	M	H	M	M	M	H
CLO5	M	M	H			M	H	H	H	H	M	H	M	H	H

H:High, M:Medium, L:Low