COURSE MODULE FOR THE SESSION 2025 (EVEN SEMESTER)

Course Syllabus with CO's

Academic Year: 2025							
Department: Computer Science & Engineering – Cyber Security							
Course Code	**Course Title**	**Core/Elective**	**Prerequisite**	**Contact Hours**			**Total Hrs/ Sessions**
				L	**T**	**P**	
BCSL657D	**DEVOPS**	**Elective**	**Devops terminology, version control.**	**-**	**-**	**2**	**12**

Objectives:

- **To introduce DevOps terminology, definition & concepts**
- **To understand the different Version control tools like Git, Mercurial**
- **To understand the concepts of Continuous Integration/ Continuous Testing/ Continuous Deployment)**
- **To understand Configuration management using Ansible**
- **Illustrate the benefits and drive the adoption of cloud-based Devops tools to solve real world problems**

Topics Covered as per Syllabus

Experiments

1 Introduction to Maven and Gradle: Overview of Build Automation Tools, Key Differences Between Maven and Gradle, Installation and Setup

2 Working with Maven: Creating a Maven Project, Understanding the POM File, Dependency Management and Plugins

3 Working with Gradle: Setting Up a Gradle Project, Understanding Build Scripts (Groovy and Kotlin DSL), Dependency Management and Task Automation

4 Practical Exercise: Build and Run a Java Application with Maven, Migrate the Same Application to Gradle

5 Introduction to Jenkins: What is Jenkins?, Installing Jenkins on Local or Cloud Environment, Configuring Jenkins for First Use

6 Continuous Integration with Jenkins: Setting Up a CI Pipeline, Integrating Jenkins with Maven/Gradle, Running Automated Builds and Tests

7 Configuration Management with Ansible: Basics of Ansible: Inventory, Playbooks, and Modules, Automating Server Configurations with Playbooks, Hands-On: Writing and Running a Basic Playbook

8 Practical Exercise: Set Up a Jenkins CI Pipeline for a Maven Project, Use Ansible to Deploy Artifacts Generated by Jenkins

9 Introduction to Azure DevOps: Overview of Azure DevOps Services, Setting Up an Azure DevOps Account and Project

10 Creating Build Pipelines: Building a Maven/Gradle Project with Azure Pipelines, Integrating Code Repositories (e.g., GitHub, Azure Repos), Running Unit Tests and Generating Reports

11 Creating Release Pipelines: Deploying Applications to Azure App Services, Managing Secrets and Configuration with Azure Key Vault, Hands-On: Continuous Deployment with Azure Pipelines

12 Practical Exercise and Wrap-Up: Build and Deploy a Complete DevOps Pipeline, Discussion on Best Practices and Q&A

List of URL's
• https://www.geeksforgeeks.org/devops-tutorial • https://www.javatpoint.com/devops • https://www.youtube.com/watch?v=2N-59wUIPVI • https://www.youtube.com/watch?v=87ZqwoFeO88
Internal Assessment Marks: 0 (3 Session Tests are conducted during the semester and Marks allotted based on best of 2 test performances).

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code	BCSL657D				Title: DEVOPS								
List of Course Outcomes	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Total
CO-1	2	2	-	-	2	-	-	-	-	-	-	-	6
CO-2	3	3	2	-	3	-	-	-	-	-	-	2	13
CO-3	3	3	2	-	3	-	-	-	-	-	-	2	13
CO-4	2	2	2	-	2	-	-	-	-	-	-	-	8
Total	10	10	6	-	10	-	-	-	-	-	-	04	40

The Correlation of Program Specific Outcome's (PS0's) and Course Outcome (CO's)

Subject Code	BCSL657D	Title: DEVOPS	
List of Course Outcome's	PSO1	PSO2	Total
CO-1	-	-	-
CO-2	-	-	-
CO-3	-	-	-
CO-4	-	-	-
Total	-	-	-

Note: 3 = Strong Contribution 2 = Average Contribution 1= Weak Contribution - = No Contribution