Semester:	III	**Course Type:**	AEC		
Course Title: Version Controller using GIT					
Course Code:	**23CSAE31**			**Credits:**	1
Teaching Hours/Week (L:T:P:O) {O – Other pedagogies, mention @}			1:0:0:3	**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	2

I. Course Objectives:

- Understand the importance of version control and distinguish between centralized and distributed systems.
- Learn to install GIT and execute basic commands for repository management.
- Explore advanced GIT operations like branching, merging, and workflows.
- Identify and resolve common GIT issues, ensuring smooth repository maintenance.
- Integrate GIT with Continuous Integration (CI) pipelines for automated testing and deployment.
- Utilize GitHub/GitLab for effective project management, collaboration, and open-source contribution.

II. Pre - Requisites:

Having prior experience in below will be very helpful in Learning(Not Compulsory).

- Basic Command Line Skills
- Text Editor or IDE proficiency
- Under Web Programming Basics

III. Teaching-Learning Process (General Instructions):

The Respective Trainer is advised to follow the Below methods.

1. A Power Point Presentation – For Course Overview and Lectures
2. Live Execution of Concepts and Make the students Replicate the same(Not copying).
3. Explain the Concepts step by step with continuous replication for larger concepts
4. Each Session should be combined with hands-on exercises

IV. COURSE CONTENT

Module-1: Introduction to Version Control and GIT Basics	8 Hrs

Understanding Version Control Systems: Overview of version control, its benefits, and popular systems, Getting Started with GIT: Installing GIT, basic commands, initializing repositories, Basic GIT Operations: Cloning, adding, committing, branching, GIT Help and Documentation: Using GIT help, understanding config files.

RBT Levels: L1, L2	
Module-2: GIT Advanced Operations and Collaboration	8 Hrs
Branching and Merging: Managing branches, resolving conflicts, Collaborating with GIT: Forking, pull requests, managing repositories, GIT Workflows: Different workflows, like centralized and feature branch, GIT Tools and Extensions: GIT GUI, IDE plugins.	
RBT Levels:L1, L2, L3	
Module-3: GIT Internals and Troubleshooting	8 Hrs
Understanding GIT Internals: Object model, references, packfiles, Troubleshooting GIT Issues: Common problems, solutions, GIT Hooks: Setting up and using hooks, GIT Best Practices: Commit messages, branching strategies.	
RBT Levels: L1, L2, L3	
Module-4: GIT and Continuous Integration/Deployment	8 Hrs
Continuous Integration Concepts: Introduction to CI/CD, benefits, tools, Setting Up a CI Pipeline with GIT: Integrating GIT, basic pipelines, Advanced CI/CD Pipelines: Handling variables, deployment strategies, Case Studies and Best Practices: Examples, maintenance tips.	
RBT Levels: L1, L2, L3	
Module-5: GIT and GitHub/GitLab Mastery	8 Hrs
Mastering GitHub/GitLab: Using features, managing teams, Advanced GitHub/GitLab Features: Actions, packages, documentation, Open Source Contribution: Finding projects, contributing, Security and Compliance with GIT: Best practices, sensitive information.	
RBT Levels: L1, L2, L3	

V. COURSE OUTCOMES

CO1	Define the importance of version control and be able to initiate a GIT repository.
CO2	Utilize branching and merging techniques and effectively collaborate using GIT in team environments.
CO3	Explain GIT's internal structure and troubleshoot common issues, ensuring a smooth version control process.
CO4	Utilize GIT with CI/CD pipelines, automating testing and deployment processes efficiently.
CO5	Demonstrate proficiency in using GitHub/GitLab for project management, contributing to open-source projects, and ensuring security compliance.

VI. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	1				3				1			1				
CO2	1				3				3	3		1				
CO3	2	2			3							1				
CO4	1				3						1	1				

CO5	1				3			1		2	1	1					

VII. Assessment Details (CIE & SEE)

General Rules: Refer CIE and SEE guidelines based on course type for autonomous scheme 2023.

Continuous Internal Evaluation (CIE): Refer Annexure section 5

Semester End Examination (SEE): Refer Annexure section 5

VIII. Learning Resources

VIII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Pro GIT Book	GIT Official	2nd Edition 2014	GIT

VIII(b): Web links and Video Lectures (e-Resources):

Title: Learn Git – Full Course for Beginners
Link: https://youtu.be/zTjRZNkhiEU?si=CHL90bu7Ixci1e6z
Title: Git For Beginners
Link: https://youtu.be/vwj89i2FmG0?si=FjSy-68PE_Sfb0nn

IX: Activity Based Learning / Practical Based Learning/Experiential learning:

- Quizzes
- Experiment the Learned Concepts