

24UAMVS201					VERSION CONTROL SYSTEM TOOLS								L/T/P/C		
													0/0/4/2		
Nature of Course					Practical										
Prerequisites					NIL										
Course Objectives:															
1.	To understand Agile concepts and principles, including Scrum and Kanban, and their application in project management.														
2.	To gain proficiency in navigating and utilizing JIRA for issue tracking, agile board setup, and project management tasks.														
3.	Developing leadership skills for effectively managing Agile teams, including configuring agile boards, initiating sprints, and generating performance reports.														
4.	To Master JIRA administration tasks such as user management, permission settings, and projectconfiguration for efficient project management.														
5.	To acquire practical skills in Git, GitHub and Power BI, including repository management, collaboration workflows, conflict resolution, dashboard creation, and best practices for version control.														
Course Outcomes: Upon completion of the course, students shall have the ability to															
CO1	Gain a comprehensive understanding of Agile methodologies,including Scrum and Kanban, and will become proficient in using JIRA for project management, issue tracking, and agile board setup.													[U]	
CO2	Apply and configure agile boards tailored to specific project needs, initiate and manage sprints, create software versions and releases, and generate sprint reports for performance analysis and improvement.													[A]	
CO3	Learn various Git collaboration workflows, including centralized,feature branch, and fork & clone workflows.													[A]	
CO4	Gain proficiency in Git and GitHub basics, including installation, repository management, collaboration workflows, and conflict resolution													[A]	
CO5	Master Power BI fundamentals for creating interactive dashboards, connecting to multiple data sources, and visualizing project management and performance metrics effectively.													[U]	
CO-PO Mapping															
Mapping of Course Outcomes to Program Outcomes (POs) & Program Specific Outcomes (PSOs):															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	2	-	3	-	-	-	-	-	1	-	2	-	1
CO2	2	-	2	-	3	-	-	-	-	-	1	-	2	-	1
CO3	2	-	2	-	3	-	-	-	-	-	1	-	2	-	1
CO4	2	-	2	-	3	-	-	-	-	-	1	-	2	-	1
CO5	2	-	2	-	3	-	-	-	-	-	1	-	2	-	1

Teaching-Learning & Assessment Scheme								
Learning Scheme			Credits	Assessment Scheme			Summative Assessment	Total
				Formative Assessment			End Semester Exam	
L	T	P		CIA-I	CIA-II	Continuous Practical Assessment (TW)		
0	0	4	2	25	25	(20) 100 Scaled Down 20	(30) 60 Scaled Down 30	100
Sr. No		List of Problem Based Learnings						CO's
1.		Setting Up Jira and GitHub Objective: Understand the basics of Jira and GitHub and set up the necessary tools. Tasks: <ul style="list-style-type: none">• Create a Jira Cloud instance and navigate the user interface.• Set up a new GitHub account and create a repository.• Install Git on your local machine and configure it with your GitHub Account• Initialize a local Git repository and link it to the GitHub repository.						CO1
2.		Basic Jira Operations and Git Commands Objective: Get hands-on experience with Jira and basic Git commands. Tasks: <ul style="list-style-type: none">• Create and configure a new Scrum project in Jira.• Create issues, epics, and stories in Jira.• Perform basic Git operations: git add, git commit, git push, and gitpull.						CO1
3.		Advanced Jira Searching and Git Branching Objective: Utilize advanced Jira search features and understand Gitbranching. Tasks: <ul style="list-style-type: none">• Use JQL for advanced issue searching in Jira.• Create search filters and dashboards in Jira.• Create and manage branches in Git: git branch, git checkout, and gitmerge.						CO1
4.		Agile Board Configuration and Git Remote Repositories Objective: Configure Jira agile boards and manage Git remote repositories. Tasks: <ul style="list-style-type: none">• Configure Scrum and Kanban boards in Jira.• Start and manage sprints in Jira.• Add a remote repository in Git, push changes, and fetch updates.						CO2
5.		Jira Administration and GitHub Collaboration Objective: Explore Jira administration features and GitHub collaboration. Tasks: <ul style="list-style-type: none">• Manage users, groups, and permissions in Jira.						CO2

	<ul style="list-style-type: none"> • Create and configure Jira workflows. • Add collaborators to a GitHub repository and manage repository settings. 	
6.	Managing Jira Workflows and Git Conflicts Objective: Configure Jira workflows and resolve Git merge conflicts. Tasks: <ul style="list-style-type: none"> • Create and edit custom workflows in Jira. • Update agile boards with new workflow changes. • Simulate and resolve merge conflicts in Git using git merge and git rebase. 	CO3
7.	Advanced GitHub Features and Jira Agile Reports Objective: Utilize advanced GitHub features and generate Jira agile reports. Tasks: <ul style="list-style-type: none"> • Create GitHub Gists and GitHub Pages. • Add README and LICENSE files to a GitHub repository. • Generate and interpret Jira sprint and project reports. 	CO3
8.	GitHub Actions and Jira Automation Objective: Implement automation using GitHub Actions and Jira automation rules. Tasks: <ul style="list-style-type: none"> • Set up a CI/CD pipeline with GitHub Actions. • Create and configure automation rules in Jira. • Integrate Jira with GitHub to automate issue tracking and commit messages. 	CO4
9.	Forking and Cloning in GitHub and Jira Project Management Objective: Understand forking and cloning in GitHub and manage Jira projects effectively. Tasks: <ul style="list-style-type: none"> • Fork a repository in GitHub and clone it to your local machine. • Make changes in the forked repository and create a pull request. • Manage multiple Jira projects and link issues across projects. 	CO4
10.	Comprehensive Project Objective: Apply all learned concepts in a comprehensive project. Tasks: <ul style="list-style-type: none"> • Set up a complete Jira project with multiple agile boards and workflows. • Create a GitHub repository for the project and configure collaboration settings. • Implement a feature using Git branching, handle merge conflicts, and automate deployment with • GitHub Actions. • Track the project's progress using Jira reports and dashboards. 	CO4
11.	Power BI Basics: Connecting to Jira and GitHub Objective: Learn to connect Power BI with Jira and GitHub for data retrieval. Tasks: <ul style="list-style-type: none"> • Set up Power BI Desktop and connect to Jira using the REST API or Power Query. • Use GitHub's REST API to connect Power BI to a GitHub 	CO4

	<p>repository.</p> <ul style="list-style-type: none"> Visualize basic metrics such as issue counts from Jira and commithistory from GitHub. 	
12.	<p>Data Transformation and Modeling in Power BI Objective: Transform raw data from Jira and GitHub into a usable format. Tasks:</p> <ul style="list-style-type: none"> Clean and shape data fetched from Jira (e.g., removing duplicates orunnecessary columns). Create relationships between datasets (e.g., link Jira issues withGitHub commits using issue IDs). Add calculated columns and measures for metrics like average timeto close an issue. 	CO5
13.	<p>KPI Dashboards in Power BI Objective: Build a KPI-focused dashboard for project tracking. Tasks:</p> <ul style="list-style-type: none"> Define KPIs like average issue resolution time, commit frequency,and sprint completion rates. Use Power BI's gauge and card visuals to display these KPIs. Add drill-through pages to show details for specific projects orsprints. Create alerts for key metrics, such as when issue counts exceed acertain threshold. 	CO5
14.	<p>Advanced Visualizations and Interactivity in Power BI Objective: Leverage advanced Power BI visuals and interactivity. Tasks:</p> <ul style="list-style-type: none"> Create custom visuals like waterfall charts and funnel charts for Jiraand GitHub data. Add buttons for navigation between different report pages. Use bookmarks to switch between detailed and summary views. 	CO5
15.	<p>Comprehensive Project Analytics Dashboard Objective: Build a unified Power BI dashboard for comprehensive projecttracking. Tasks:</p> <ul style="list-style-type: none"> Integrate data from multiple Jira projects and GitHub repositories. Create a consolidated view of project health, including issueprogress, code contributions, and sprint performance. Add drill-down and drill-through capabilities for deeper analysis ofspecific metrics. 	CO5
	Total Hours:	30

Outcome:

- Integrated Project Tracking:** Unified dashboards combining Jira and GitHub data for real time monitoring and decision-making.
- Advanced Data Insights:** KPI-focused analytics with interactive Power BI visuals for agile performance and repository trends.
- Enhanced Collaboration:** Streamlined workflows with Git branching, CI/CD pipelines, and Jira-GitHub automation.

Text Books:

1. Patrick Li, "JIRA 5.2 Essentials", Packt Publication, 2013.
2. Matthew B Doar, "Practical JIRA Administration", O'Reilly Media Publication, 2011.
3. Devin Knight, "Microsoft Power BI Complete Reference: Bring Your Data to Life with the Powerful Features of Microsoft Power BI", Packt Publication, 2024.
4. Devin Knight, "Microsoft Power BI Quick Start Guide: The Ultimate Beginner's Guide to Data Modeling, Visualization, Digital Storytelling, and More", Packt Publication, 2022.

Web References:

1. <https://learngitbranching.js.org/>
2. <https://www.atlassian.com/software/jira>
3. <https://learn.microsoft.com/en-us/power-bi/>
4. <https://www.w3schools.com/git/>