A. Course Handout (Version 1.1) | Last update on 14th Dec, 2022

Institute/ Name	Chitkara University Institute of Engineering & Technology		
Department Name	Department of Computer Science & Engineering		
Programme Name	Bachelor of Engineering (B.E.) Computer Science & Engineering		
Course Name	Source Code Management	Session	2022-23
Course Code	CS181	Semester/Batch	2nd/2022
L-T-P (Per Week)	2-0-0	Course Credits	03
Course Coordinator	Dr. Sunil Gupta		

1. Scope and Objectives of the Course

This course helps learners to become functional in open-source ecosystem. The course focus on enabling learners to examine the functionality of Software Version Control Systems. Version control systems are used to maintain various versions of same source code for maintainability and agility. The learners shall utilize the functionality of GIT to support version control of source code. The users of Software version control system are able to assess workflows in various version control systems like Git. The learners can apply the workflows to create collaboration with Co Participants on a software project.
After the completion of course student will be able to:

- Become familiar with environment of version control system.
- Utilize the functionalities of version control system to track running history for maintainability and agility of source code.
- Work in Collaborative teams to work through open-source ecosystem.

2. Course Learning Outcomes

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

	Course learning Outcome	POs	CL	KC	Sessions
CLO01	Describe the fundamentals of source code management and its history with examples.	PO1,PO2,PO4,PO5,PO11,PO12	K2	Factual Conceptual	**5**
CLO02	Relate to best practices to be adopted by organizations to achieve continuous integration.	PO1,PO2,PO3,PO4,PO5,PO9,PO10,PO12	K3	Fundamental Conceptual	**5**
CLO03	Compare the utility of centralized and distributed version control systems and their basic operations.	PO1, PO2,PO5,PO9,PO12	K4	Conceptual Procedural	**4**
CLO04	Utilize distributed version control systems over centralized version control systems.	PO1,PO3,PO4,PO9,PO11,PO12	K4	Conceptual Procedural	**4**
CLO05	Design a remotely controlled repository in an open-source environment.	PO1,PO2,PO3, PO5,PO9,PO11, PO12	K3	Conceptual Procedural	**6**
Total Sessions					**30**

Revised Bloom's Taxonomy Terminology

*Cognitive Level =CL
*Knowledge Categories = KC

Course Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO01	H	M		L	M						M	M
CLO02	H	H	H	M	M				H	M		H
CLO03	M	M			H				H			M
CLO04	L		M	H					M		H	
CLO05	H	H	H		M				H		M	M

H=High, M=Medium, L=Low

3. ERISE Grid Mapping

Feature Enablement	Level(1-5, 5 being highest)
Entrepreneurship	3
Research	4
Innovation	4
Skills	5
Employability	4

4. Recommended Books (Reference Books/Text Books):

B01: Pro Git by Scott Chacon and Ben Strob,Apress Available at https://git-scm.com/book/en/v2
B02: Learn Version Control with Git: A step-by-step course for the complete beginner by Tobias Günther
B03: GIT: The Ultimate Guide for Beginners: Learn Git Version Control by Jameson Garner

5. Other readings and relevant websites:

Serial No	Link of Journals, Magazines, websites and Research Papers
1.	https://docs.github.com/en
2.	https://docs.github.com/en/discussions
3.	https://docs.github.com/en/communities
4.	https://docs.github.com/en/developers
5.	Github.com

6. Recommended Tools and Platforms

Github.com, Git Client available at https://git-scm.com/book/en/v2/Getting-Started-Installing-Git

7. Course Plan:

Session Number	Topics	Recommended Book
1-3	Introducing Version Control – Git client(CLI, GUI), Linux environment Emulation Installing git CLI and git GUI Initializing the repository, and exploring git –help	B01
4-6	Exploring Github and Creating a Public Repository – Creating repository, understanding controls on the panel, working on Git Hub alone, realizing the significance of Git Client for Github utilization	B01
7-9	Working With Git – Commands for initiating repos, managing repos Git status, add, commit, stage – Life cycle of a file in Git managed in Repos Git branches and HEAD, Git branches management, Create a new branch, Commit changes in the new branch, Explore commit in the new branch	B01,B02
	Task 1.1 (Assessments)	
10-12	Git Cloning, exploring and modifying public repositories - Cloning repository, Exploring contents of the cloned repository, Unpacking Git objects, Exploring cloned repository in GitHub Desktop, Commit changes in the cloned repository Git Configuration Files – creating personalized configurations	B02
	Project work allocation : Students Project Group Initialize	
13-15	Git attributes and gitignore, Staging files - /attributes for managing, filtering, masking Working With Git History – Forensics on GIT logs Log, graphical history, undo changes in history – creating presentable GUI for GIT activity in versioned repos	B03
16-18	Merge Resolution In Git – Branching, tagging branches, creating test, dev, prod branches Scenario creation for conflict creation while merging branches by a single user, multiple users	B01,B03
19-21	Git branch, basic conflict and merge resolution workflow- Resolution of merge conflicts GitHub and remote repositories - Cloning remote repository, What is a remote repository	B02,B03
22-24	Git push, fetch and pull operations - Pushing to the remote repository, FETCH_HEAD, perform a git pull, Git pull with fast forward merge, Resolving conflicts during Git pull	B02,B03
	Task 1.2 - (Assessments)	
25-30	Project with teamwork demonstrating all aspects of GIT	B01,B02
	Task 2 - Assessments : Project Completion of each group and Submission the project report.	

8. Delivery/Instructional Resources

Session Number	Topics	PPT *(link of ppts on the central server)*	Industry Expert Session	Web References	Audio-Video
1-3	Introducing Version Control – Git client(CLI, GUI), Linux environment Emulation	https://docs.github.com/en/repositories/creating-and-managing-		1. https://git-scm.com/book/en/v2/Getting-Started-Installing-Git	https://git-scm.com/video/what-is-version-control

	Installing git CLI and git GUI Initializing the repository, and exploring git –help	repositories/creating-a-template-repository			
4-6	Exploring Github and Creating a Public Repository – Creating repository, understanding controls on the panel, working on Git Hub alone, realizing the significance of Git Client for Github utilization	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		1. https://git-scm.com/book/en/v2/Getting-Started-First-Time-Git-Setup 2. https://git-scm.com/book/en/v2/Getting-Started-Getting-Help	https://git-scm.com/video/what-is-git
7-9	Working With Git – Commands for initiating repos, managing repos Git status, add, commit, stage – Life cycle of a file in Git managed in Repos Git branches and HEAD, Git branches management, Create a new branch, Commit changes in the new branch, Explore commit in the new branch	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		1. https://git-scm.com/book/en/v2/Git-Basics-Getting-a-Git-Repository 2. https://git-scm.com/book/en/v2/GitHub-Account-Setup-and-Configuration 3. https://git-scm.com/book/en/v2/Git-Basics-Working-with-Remotes	https://git-scm.com/video/what-is-version-control
10-12	Git Cloning, exploring and modifying public repositories - Cloning repository, Exploring contents of the cloned repository, Unpacking Git objects, Exploring cloned repository in GitHub Desktop, Commit changes in the cloned repository Git Configuration Files – creating personalized configurations	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		1. https://git-scm.com/book/en/v2/Git-Basics-Getting-a-Git-Repository 2. https://git-scm.com/book/en/v2/Git-Basics-Recording-Changes-to-the-Repository	https://git-scm.com/video/what-is-version-control
13-15	Git attributes and gitignore, Staging files - /attributes for managing, filtering, masking Working With Git History – Forensics on GIT logs Log, graphical history,	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		1. https://git-scm.com/book/en/v2/Git-Tools-Interactive-Staging 2. https://git-scm.com/book/en/v2/Git-Tools-Stashing-and-	https://git-scm.com/video/what-is-version-control

	undo changes in history – creating presentable GUI for GIT activity in versioned repos			Cleaning	
16-18	Merge Resolution In Git – Branching, tagging branches, creating test, dev, prod branches Scenario creation for conflict creation while merging branches by a single user, multiple users	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		1. https://git-scm.com/book/en/v2/Customizing-Git-Git-Configuration 2. https://git-scm.com/book/en/v2/Customizing-Git-Git-Attributes	https://git-scm.com/video/what-is-version-control
19-21	Git branch, basic conflict and merge resolution workflow- Resolution of merge conflicts GitHub and remote repositories - Cloning remote repository, What is a remote repository	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		1. https://git-scm.com/book/en/v2/Customizing-Git-Git-Attributes	https://git-scm.com/video/what-is-version-control
22-24	Git push, fetch and pull operations - Pushing to the remote repository, FETCH_HEAD, perform a git pull, Git pull with fast forward merge, Resolving conflicts during Git pull	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository	Industry expert talk on Git	1. https://git-scm.com/book/en/v2/Git-Basics-Viewing-the-Commit-History	https://git-scm.com/video/what-is-version-control
25-30	Project work with teamwork demonstrating all aspects of GIT like opening and closing a pull request, collaborative work on GitHub, Explain utility of Fetch and Pull while collaboration and implement a distributed workflow in a team.	https://docs.github.com/en/repositories/creating-and-managing-repositories/creating-a-template-repository		NA	

9. Action plan for different types of learners

Slow Learners	Average Learners	Fast Learners
• Remedial Classes on Saturdays • Encouragement for improvement using peer tutoring	• Workshops • Formative Exercises used to highlight concepts and notions • E-notes and E-exercise to read	• Coding Competitions • Design Solutions for complex problems • Presentation on topics beyond

• Use of audio and visual material • Use of Real-Life Examples	in adaptive to pedagogic metrical.	those covered in CHO

10. Evaluation Scheme & Components:Continuous evaluation shall be adopted

Evaluation Component	Type of Component	No. of Assessments	Weightage of Component	Mode of Assessment
Component 1	Task 1	02*	60%	Online on GitHub
Component 2	Group Task	01**	40%	Online on GitHub
Total		**100%**		

* In 02assessments of Task 1, the ERP system will automatically calculate the average of assessment marks for evaluation to be incorporated in trail results.
** There will be no end-term exams and at the end, only students will submit a report of their project in the form of a hard copy of the course.

11. Details of Evaluation Components:

Evaluation Component	Description	Syllabus Covered (%)	Timeline of Examination	Weightage (%)
Task 1	Task 1.1	Upto 50%	Week 4	60%
	Task 1.2	51% - 100%	Week 8	
Task 2	Project Completion and Report Submission from the entire course	100%	Week 10	40%
Total				100%

* As per Academic Guidelines minimum of 75% attendance is required to become eligible for continuous evaluation

Evaluation Components

Type of Assessment	Timeline of Conduct	Total Marks	Description of Tasks for Evaluation But not limited is
Task 1.1	Week 4	30	1. Setting up of Git Client, 2. Setting up GitHub Account, 3. Generate logs 4. Create and visualize branches 5. Git lifecycle description
Task 1.2	Week 8	30	1. Add collaborators on GitHub Repo 2. Fork and Commit 3. Merge and Resolve conflicts created due to own activity and collaborators activity. 4. Reset and Revert
Task 2	Week 13	40	1. Create a distributed Repository and add members in project team 2. Open and close a pull request. 3. Each project member shall create a pull

			request on a team members repo and close pull requests generated by team members on own Repo as a maintainer. 4. Publish and print network graphs 5. Submission of report in PDF carrying screenshots and detailed writing of steps taken to achieve all tasks.

12. Syllabus of the Course:

Session Number	Topic	No. of Lectures	Weightage %
1-3	Introducing Version Control – Git client(CLI, GUI), Linux environment Emulation Installing git CLI and git GUI Initializing the repository, and exploring git –help	3	30 %
4-6	Exploring Github and Creating a Public Repository – Creating repository, understanding controls on the panel, working on Git Hub alone, realizing the significance of Git Client for Github utilization	3	
7-9	Working With Git – Commands for initiating repos, managing repos Git status, add, commit, stage – Life cycle of a file in Git managed in Repos Git branches and HEAD, Git branches management, Create a new branch, Commit changes in the new branch, Explore commit in the new branch	3	
10-12	Git Cloning, exploring and modifying public repositories - Cloning repository, Exploring contents of the cloned repository, Unpacking Git objects, Exploring cloned repository in GitHub Desktop, Commit changes in the cloned repository Git Configuration Files – creating personalized configurations	3	30%
13-15	Git attributes and gitignore, Staging files - /attributes for managing, filtering, masking Working With Git History – Forensics on GIT logs Log, graphical history, undo changes in history – creating presentable GUI for GIT activity in versioned repos	3	
16-18	Merge Resolution In Git – Branching, tagging branches, creating test, dev, prod branches Scenario creation for conflict creation while merging branches by a single user, multiple users	3	
19-21	Git branch, basic conflict and merge resolution workflow- Resolution of merge conflicts GitHub and remote repositories - Cloning remote repository, What is a remote repository	3	
22-24	Git push, fetch and pull operations - Pushing to the remote repository, FETCH_HEAD, perform a git pull, Git pull with fast forward merge, Resolving conflicts during Git pull	3	

25-30	Project with teamwork demonstrating all aspects of GIT		

This documentis approved by:

Designation	**Name**	**Signature**
Course Coordinator	Dr. Sunil Gupta	
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Date		