A. Course Handout

Institute/School Name	Chitkara University Institute of Engineering and Technology		
Department Name	Department of Computer Science & Engineering		
Programme Name	Bachelor of Engineering (B.E.), Computer Science & Engineering		
Course Name	Source Code Management	Session	2021-22
Course Code	CS181	Semester/Batch	2nd/2021
L-T-P (Per Week)	2-0-0	Course Credits	02
Course Coordinator	Dr. Parag Verma		

1. Scope and Objectives of the Course

This course helps learners to become functional in open-source ecosystem. The course focusses 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.

2. Course Learning Outcomes

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

CLO01: Describe the fundamentals of source code management and its history with examples.
CLO02: Relate to best practices to be adopted by organizations to achieve continuous integration and deployment in DevOps.
CLO03: Compare the utility of centralized and distributed version control systems and their basic operations in version control systems
CLO04: Utilize distributed version control systems over centralized version control systems.
CLO05: Design a remotely controled repository in an open-source environment.

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

3. 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: A beginner's guide to DevOps available at https://www.dynatrace.com/resources/ebooks/devops/

B03: Version Control with Git: Powerful tools and techniques for collaborative software development Second Edition by Jon Loeliger (Author), Matthew McCullough (Author)

B04: Learn Version Control with Git: A step-by-step course for the complete beginner by Tobias Günther

B05: GIT: The Ultimate Guide for Beginners: Learn Git Version Control by Jameson Garner

4. 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

5. Recommended Tools and Platforms

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

6. Course Plan:

Session Number	Topics
1-2	Introducing Version Control – Git client(CLI, GUI), Linux environment Emulation Installing git CLI and git GUI Initializing the repository, and exploring git –help
3-4	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
5-6	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
Task 1.1 (Assessments)	
7-8	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
9-10	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
11-12	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
13-14	Git branch, basic conflict and merge resolution workflow- Resolution of merge conflicts GitHub and remote repositories - Cloning remote repository, What is a remote repository
15-16	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
Task 1.2 - (Assessments)	

17-24	Project with teamwork demonstrating all aspects of GIT
Task 2	

7. Delivery/Instructional Resources

Session Number	**Topics**	**PPT** *(link of ppts on the central server)*	**Industry Expert Session***(If **yes**: link of ppts on the central server)*	**Web References**	**Audio-Video**
1-2	Introducing Version Control – Git client(CLI, GUI), Linux environment Emulation Installing git CLI and git GUI Initializing the repository, and exploring git –help			1. https://git-scm.com/book/en/v2/Getting-Started-Installing-Git	https://git-scm.com/video/what-is-version-control
3-4	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			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
5-6	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			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
7-8	Git Cloning, exploring and modifying public repositories -			1. https://git-scm.com/book/en/v2/Git-Basics-Getting-a-Git-Repository	https://git-scm.com/video/what-is-version-control

	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			2. https://git-scm.com/book/en/v2/Git-Basics-Recording-Changes-to-the-Repository	
9-10	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			1. https://git-scm.com/book/en/v2/Git-Tools-Interactive-Staging 2. https://git-scm.com/book/en/v2/Git-Tools-Stashing-and-Cleaning	https://git-scm.com/video/what-is-version-control
11-12	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			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
13-14	Git branch, basic conflict and merge resolution workflow-Resolution of merge conflicts GitHub and remote repositories - Cloning remote repository, What is a remote repository			1. https://git-scm.com/book/en/v2/Customizing-Git-Git-Attributes	https://git-scm.com/video/what-is-version-control
15-16	Git push, fetch and pull operations - Pushing to the remote repository, FETCH_HEAD, perform a git pull, Git pull with fast forward merge,			1. https://git-scm.com/book/en/v2/Git-Basics-Viewing-the-Commit-History	https://git-scm.com/video/what-is-version-control

	Resolving conflicts during Git pull				
17-24	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.			NA	

8. Action plan for different types of learners

Slow Learners	Average Learners	Fast Learners
Remedial Classes on Saturdays	Workshop	Projects

9. 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 02 assessments of Task 1, the ERP system automatically calculate the average of assessments marks for evaluation of the Tasks as final marks.

** 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.

10. 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 13	40%
Total				100%

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

Evaluation Components

Type of Assessment	Time of Conduction	Total Marks	Description of Tasks for Evaluation
Task 1.1	Week 4	60	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	60	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.

11. Syllabus of the Course:

Session Number	Topic	No. of Lectures	Weightage %
1-2	Introducing Version Control – Git client(CLI, GUI), Linux environment Emulation Installing git CLI and git GUI Initializing the repository, and exploring git –help	2	30 %
3-4	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	2	
5-6	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	2	
7-8	Git Cloning, exploring and modifying public repositories - Cloning repository, Exploring contents of the cloned repository, Unpacking Git objects, Exploring cloned repository in GitHub	2	

	Desktop, Commit changes in the cloned repository Git Configuration Files – creating personalized configurations		
9-10	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	2	30%
11-12	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	2	
13-14	Git branch, basic conflict and merge resolution workflow- Resolution of merge conflicts GitHub and remote repositories - Cloning remote repository, What is a remote repository	2	
15-16	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	2	

This document is approved by:

Designation	**Name**	**Signature**
Course Coordinator	Dr. Parag Verma	
Head – Academic Delivery	Dr. Atul Garg	
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Date	17.02.2022	