**SIW 1: Working with Git**

**1. Registration and Account Setup on GitHub**

* Register on **GitHub** if you do not have an account yet.
* Customize your profile by adding a **name, profile photo, and a short bio**.

**2. Creating a Repository**

* Create a new repository for **storing laboratory work**.
* Initialize the repository with a **README.md** file.

**3. Basics of Working with Git**

* Clone the repository to a local computer using:

git clone <repository\_url>

* Study and apply the basic Git commands:
* git add <filename> # Stage changes
* git commit -m "Commit message" # Commit changes
* git push origin main # Push changes to GitHub

git pull origin main # Pull latest changes from GitHub

**4. Loading Laboratory Work**

* Upload lab files to the repository using:
* git add . # Add all changes
* git commit -m "Added lab work files"

git push origin <branch\_name>

* Create a separate branch for each lab work using:

git checkout -b lab-01

**5. Working with Branches**

* Create and switch between branches:
* git branch <new\_branch>

git checkout <branch\_name>

* Merge lab branches into the main branch:
* git checkout main

git merge <branch\_name>

**6. Rolling Back Changes**

* Use git revert and git reset to roll back changes:
* git log --oneline # View commit history
* git revert <commit\_hash> # Revert a specific commit

git reset --hard <commit\_hash> # Reset to a previous commit

**7. Access and Security**

* Set up **repository access rights** for collaborators.
* Use **SSH keys** to work securely with remote repositories:

ssh-keygen -t rsa -b 4096 -C "your\_email@example.com"

* + Add the SSH key to GitHub under **Settings > SSH and GPG keys**.

**8. Automation with Git**

* Configure **Git Hooks** to automate tasks:
* cd .git/hooks
* echo "#!/bin/sh" > pre-commit

chmod +x pre-commit

* Write simple scripts to automate tasks when certain actions occur in the repository.