CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

C S Patel Institute of Technology

U & P U. PATEL DEPARTMENT OF COMPUTER ENGINEERING

Subject Code: CE343 **Academic Year-**2022-23

Subject Name: Software Engineering **Semester: 5**th Semester

- **Students need to be wok in group of 4/5, based on selection by faculty members for batch, same group will be there in SGP course project. They need to select real-life live client-based project**.
- **There are series of activity in class / labs for practical learning, especially for Biding of Projects, Request for Proposal, Design Thinking, Agile Methodology, Project Management Case studies, Demonstration of Tools, etc.**
- **Appendix A includes the relevant tool list for practical.**

SR. NO	UNIT TOPICS	PRACTICAL	LEARNING OUTCOMES	CO
1	Role of Software & Software engineering	**[A]Role of Software** **Background**: Software has made the world a global village today. The impact of software spans across almost all aspect of human life. All organizations, Institutions and companies are leveraging the potentials of software in automating the critical functions and eliminating manual interventions. Software is also a predominant are for trade and export especially for the countries like India. Domains like health care, Airlines, financial Services, Insurance, retails, Education, and many more have exploited software and still there a lot of the scope for software to create impact and add values in multiple dimensions. **Problem Description**: In the context of this background, identify the areas (or application or systems) how software has been leveraged extensively in the following domains 1. Health Care 2. Airlines 3. Banking Insurance 4. Retail 5. Education ***[PPT Presentation is must by group of students allocated by faculty members, each batch must cover at least one specific domain.]***	1. Students should able to understand software, software development and software industry. 2. Students should able to know various domains of IT sectors.	1

		[B] Role of Software Engineering in IT industry: Case study of industry with live survey of their employee and team members for usage and usefulness of Software engineering principals, documentations, SE practices, Standards, CMM/ISO, etc. ***[Students need to do prepare questionnaires and do survey and interview to gather information and find conclusion about role of SE in IT industries]***		
2	Software Process Models	Study and compare different software process models and compare them based on cost, simplicity, risk, involvement of user, flexibility, maintenance, integrity, security, re-usability, and requirement. ***[Students need to study all models and present GroupWise; particular batch must cover each process models and finally students have to select particular process model for their SGP project with proper assessment and justification.]***	1. Students should able to justify and select their process model wisely.	1,2
3	Requirement Analysis and Specification	Design interview, record review, brain storming, questionnaires and observation techniques to elicit requirements for the given project. ***[Student must record, capture video, survey, photographs pics compulsory for all techniques of requirement gathering]***	1. Students should get experience for gathering requirements using different techniques. 2. Students should understand prose and cones of each requirement gathering techniques.	1,2,3
4	Understanding the Requirement, Requirement Specification (SRS)	Determine and analyze the functional & non- functional Requirements for a given project and then Design System Requirement Specification (SRS) document for a given project • Usecase Diagram and Usecase narratives • User Story	1. Students should Analyze and brain storm requirement and validate same. 2. Students should able to convert requirements in to SRS format. 3. Students should able to develop Usecase diagram with its narrative and User story.	2,3
5	Software Project	• Calculate cost estimation for the project using FP calculation and COCOMO model. After manual calculation use COSTAR/SYSTEM	1. Students should able to estimates their project Time,	4

	Estimations & Planning	STAR Tool to calculate and explore other parameters for estimation of cost of your project. • Develop a Software Project Management Plan using Microsoft Project 2003/2007, JIRA/Redmine tool.	Effort and Cost using Analytical techniques.	
6	Software Design - Procedure Oriented and Database	• Prepare design document for your project (SmartDraw, Visio 2007) • Procedure oriented methodology (DFD up to level 2, Structure chart, ERD, Data Dictionary.	1. Students should know CASE tool for design and able to procedure-oriented design and Database design.	3
7	Software Design- GUI & Object Oriented (UML)	• Prepare design document for your project (SmartDraw, Visio 2007) using Object oriented methodology (UML-Class, Activity, State chart, Sequence, Collaboration) • Prepare UI Design- Input, Output and Navigation (ForeUI, PencilTool).	1. Students should able to use CASE tools for UML and GUI design.	3,4
8	Coding Standard and Software Configuration Management	• Design coding standards and guidelines for a given project in particular programming language. [Any specific IDE]. • Practicing with **'Version Control System-GIT'**. Create repository and mention the demos of push command and Pull request. Reference link: https://opensource.com/article/19/5/practical-learning-exercise-git • Explore the Jenkins DevOps tool as a continuous Integration and continuous deployment tool. https://www.guru99.com/jenkins-tutorial.html	1. Students should follow and practice coding standards in IDE 2. Students should learn how to use CI/CD pipeline for collaborative development.	4
9	Testing	• Design the Test Suites and Test Cases for the given project Box Testing, White Box Testing, Gray Box testing. [Manual and Automated Testing] • Use tool: Selenium Automation (Web driver, TestNG) • Installation of **Selenium automated testing tool** and Create Test Scripts in Selenium. Reference link: https://www.guru99.com/selenium-python.html • Installation of J-Unit Testing Framework and Create and run the Test case for java programs with J-unit. Reference link: https://www.guru99.com/junit-tutorial.html	1. Students should able to design test cases for their functionalities. 2. Develop automation testing script suing tool.	2,4,5
			Total Hours (Lab): 30	

Case study-based Assignment

1	**Background:** Performance testing tests the non-functional requirements of the system. The different types of performance testing are load testing, stress testing, endurance testing and spike testing. **Problem Description**: Identify the type of performance testing for the following: 1. A university uses its web based portal for publishing the results of the students. When the results of an examination were announced on the website recently on a pre-planned date, the web site crashed. Which type of performance testing should have been done during web-site development to avoid this Unpleasant situation? 2. A space craft is expected to function for nearly 8 years in space. The orbit control system of the spacecraft is a real-time embedded system. Before the launch, the embedded software is to be tested to ensure that it is capable of working for 8 years in the space. Identify the suitable performance testing category to be carried out to ensure that the space craft will be functioning for 8 years in the space as required. 3. During unexpected terrorist attack, one of the popular websites crashed as many people logged into the web-site in a short span of time to know the consequences of terrorist attack and for immediate guidelines from the security personnel. After analyzing the situation, the maintenance team of that website came to know that it was the consequences of unexpected load on the system which had never happened previously. Which type of performance testing should have been done during web-site development to avoid this unpleasantsituation? Global Education Centre (GEC) at Infosys Mysore provides the training for fresh entrants. GEC uses an automated tool for conducting objective type test for the trainees. At a time, a maximum of 2000 trainees are expected to take the test. Before the tool is deployed, testing of the tool was carried out to ensure that it is capable of supporting 2000 simultaneous users. Indicate the performance testing category?
2	**Background:** There are some metrics which are fundamental and the rest can be derived from these. Examples of basic (fundamental) measures are size, effort, defect, and schedule. If the fundamental measures are known, then we can derive others. For example, if size and effort are known, we can get Productivity (=size/effort). If the total numbers of defects are known, we can get the Quality (=defect/size) and so on. **Problem Description**: Online loan system has two modules for the two basic services, namely Carloan service and House loan service. The two modules have been named as Car_Loan_Module and House_Loan_Module. Car_Loan_Module has 2000 lines

	of uncommented source code. House_Loan_Module has 3000 lines of uncommented source code. Car_Loan_Module was completely implemented by Mike. House_Loan_Module was completely implemented by John. Mike took 100 person hours to implement Car_Loan_Module. John took 200 person hours to implement House_Loan_Module. Mike‟s module had 5 defects. Jonh‟s module had 6 defects. With respect to the context given, which among the following is an INCORRECT statement? Choose One: 1. John‟s quality is better thanMike. 2. John‟s productivity is more thanMike. 3. John introduced more defects thanMike. John‟s effort is more thanMike
3	Study different CASE tools and Testing tools (QTP, qTest, IBM Rational Functional tester, MSC (message sequence chart), SDL (specification and description language), TTCN (testing and test control notation), TTCN-3) and prepare a summary report.
4	Design Thinking and Agile Methodology Activities with Presentation with Concept Poster. ***[Students need to do activities for implementation of Design Thinking and Agile Methodology separately to solve some innovative idea in group of 5-6 in batch or class]***
5	How your site performs, reveal why it's slow and discover optimization opportunities with **GTMetrix.**
6	Explore SONARQUBE as Software Coding Analysis Tools for Code Inspection to check the Quality of code with

APPENDIX A

ESTIMATION TOOLS
COSTAR/SYSTEM STAR Tool

SOFTWARE PROJECT MANAGEMENT PLAN
Microsoft Project 2003/2007
OpenProject
LibrePlan
ProjectLibre

DESIGN TOOLS
Microsoft Visio 2007/2010/2013/2016,
Pencil Tool
ForeUI
UMLet 14.2
SmartDraw
OpenSource Tool

TESTING TOOLS
WinRunner
Silk Runner
Load Runner
Selenium/Appium

DIFFERENT CASE TOOLS AND TESTING TOOLS
QTP
QTest

IBM Rational Functional tester
MSC (message sequence chart)
SDL (specification and description language),
TTCN (testing and test control notation)
TTCN-3