COMSATS University Islamabad
Sahiwal Campus
(Department of Computer Science)

Course Title:	Software Engineering		Course Code:	CSC291	Credit Hours:	3
Course Instructor:	Ms. Sameen Fatima		Program Name:	Bachelor of Science in CS_____		
Semester:	3rd	Batch:	Section: G	Date:	9-12-2025	
Time Allowed:			Maximum Marks:			
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CLOs Addressed	CLO1		CLO2		CLO3	
	Question Nos.	Max. Marks.	Question Nos.	Max. Marks.	Question Nos.	Max. Marks.
					1	5

Important Instructions / Guidelines:

Read the question paper carefully and answer the questions according to their statements.

Mobile phones are not allowed. Calculators must not have any data/equations etc. in their memory.

Assignment # 5

Q # 1. *CLO 5: "Demonstrate software project management skills and maintenance process*
Software project management plays a vital role in ensuring successful software development, while software maintenance ensures the long-term performance and usability of the product after deployment.
In this context, write a conceptual report covering the following:
Conceptual Report on Software Project Management and Maintenance
1. Software Project Management (SPM) and Its Significance
Software Project Management (SPM) is the process of planning, organizing, monitoring, and controlling software projects to ensure they are completed on time, within budget, and with the required quality.
SPM is significant because it helps manage resources efficiently, reduces risks, improves communication, and ensures that customer expectations are met throughout the development lifecycle.

2. Key Project Management Skills (with Examples)
A software project manager must possess several essential skills:
- *Planning Skills: Ability to create project schedules and milestones.*
  Example: Preparing a detailed Gantt chart for the development phases.
- *Communication Skills: Ensuring smooth coordination between developers, testers, and stakeholders.*
- *Risk Management: Identifying risks such as delays or technical issues and developing mitigation plans.*
- *Leadership: Motivating the team and resolving conflicts during development.*
- *Problem-Solving: Handling unexpected issues like requirement changes or resource shortages.*

3. Phases/Activities in Software Project Management
SPM generally includes the following phases:
1. *Project Initiation: Define objectives, feasibility, and project scope.*

2. *Project Planning: Develop schedules, budgets, and resource allocation plans.*
3. *Execution: Team members perform development tasks according to the plan.*
4. *Monitoring and Controlling: Track progress, manage risks, and ensure quality.*
5. *Project Closure: Final delivery, evaluation, documentation, and customer sign-off.*

4. Software Maintenance and Its Importance

Software Maintenance refers to the process of modifying and updating software after deployment. Its importance lies in ensuring long-term functionality, fixing post-release errors, improving performance, and adapting the software to new business or technical environments.

5. Types of Software Maintenance (with Scenarios)

1. *Corrective Maintenance: Fixing bugs or errors.*
   *Example: Repairing a login failure reported **by users.***
2. *Adaptive Maintenance: Updating software due to environmental changes.*
   *Example: Modifying an app after an operating system **update.***
3. *Perfective Maintenance: Enhancing features or improving performance.*
   *Example: Adding a search filter to improve user **experience.***
4. *Preventive Maintenance: Restructuring code to avoid future issues.*
   *Example: Cleaning and optimizing code to prevent system **crashes.***
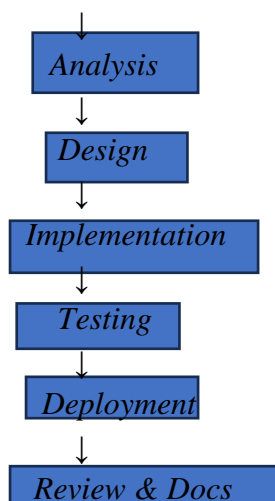
6. Software Maintenance Process/Lifecycle (with Diagram)

Software Maintenance Lifecycle Steps:
1. *Problem/Change Identification*
2. *Analysis*
3. *Design*
4. *Implementation*
5. *Testing*
6. *Deployment*
7. *Review and Documentation*

Diagram (Text-Based):

Problem Identification

Analysis
↓
Design
↓
Implementation
↓
Testing
↓
Deployment
↓
Review & Docs

7. Conclusion

Software project management ensures structured planning, efficient execution, and controlled development of software, while software maintenance ensures long-term system stability and user satisfaction after deployment. Together, both processes contribute significantly to software quality, reliability, and continuous improvement.

Reference: *Source: https://www.geeksforgeeks.org/software-engineering*

The End