Project Request Instructions

Project Title

Designing, Building, and Managing a Cloud-Ready Software Product Using Agile, DevOps, and Software Engineering Practices

Objective

This project challenges students to apply computer science methods and algorithms while demonstrating professional conduct, teamwork, and ethical responsibility. Students will investigate, analyze, and use appropriate software tools to develop a cloud-ready, reliable, and high-quality software product. The project simulates an end-to-end development cycle, requiring agile practices, DevOps pipelines, software architecture design, quality assurance, risk analysis, and testing. Students will deliver a product that meets professional standards of software development.

Learning Outcomes

1 Apply various computer science methods and algorithms to design and implement robust software.
2 Demonstrate appropriate professional conduct, including accountability, time management, and ethical awareness.
3 Investigate, analyze, and use software tools across the software development life cycle.
4 Work effectively as members of a group, using agile collaboration and DevOps practices.
5 Demonstrate understanding of ethical and professional responsibilities in developing software for real-world contexts.

Project Scope

Students will work in teams to design, develop, test, and deploy a cloud-based software system (e.g., a scalable booking platform, e-commerce application, or educational service). The scope includes:

Software Product Management   *5 points*

- Define product vision, goals, and success metrics.
- Build and prioritize a product backlog.
- Manage evolving requirements with stakeholders.

Agile Software Engineering   *5 points*

- Develop sprint plans and user stories.
- Practice agile ceremonies (stand-ups, reviews, retrospectives).
- Deliver incremental releases of the product.

Features, Scenarios & Stories   *5 points*

- Write detailed user stories with acceptance criteria.
- Develop feature scenarios and link them to implementation.
- Validate scenarios with testing artifacts.

DevOps and Code Management   *5 points*

- Implement version control workflows (branching, merging, pull requests).
- Set up continuous integration and delivery (CI/CD).
- Automate builds, tests, and deployments.

Software Architecture   *5 points*

- Design overall architecture of the system.
- Integrate cloud-based and microservice software architecture where appropriate.
- Ensure scalability, reliability, and modularity.

Reliable Programming & Quality Assurance   *5 points*

- Apply coding standards, reviews, and best practices.
- Implement automated and manual quality assurance techniques.
- Ensure fault-tolerance and maintainability.

Risk Analysis & Testing   *5 points*

- Identify technical, organizational, and security risks.
- Propose mitigation strategies.
- Apply systematic testing (unit, integration, system, acceptance).

Assessment criteria: Total grade is 35 points