Course Syllabus

Code - Course Title	**AYG226 - Software Testing and Quality Processes**
Course Type	IV. SEMESTER
Laboratory + Practice	2+2
ECTS	**4.0**
Language of Instruction	Türkçe
Course Type	Area Elective Courses
Course Instructor(s)	ÖĞR. GÖR. AHMET MÜCAHİD ARVASİ

Mode of Delivery	Face to face
Prerequisites	There are no prerequisites or corequisites for this course.

Course Syllabus

Weeks	Learning Outcomes	Topics	Teaching Methods
Week - 1		Software Testing Fundamentals: Software Quality Assurance (QA), Test Types, Pyramid Model, and Basic Testing Principles	
Week - 2		Introduction to Unit Testing: Pure Functions, Testable Code Design, and Dependency Isolation	
Week - 3		Using Mock/Stub Objects, Spy Objects, and Behavior Verification Methods	
Week - 4		Integration Testing: Inter-module Communication, Database Integration, and Cross-Layer Verification	
Week - 5		Test-Driven Development (TDD) 1: Basic Philosophy and Red-Green-Refactor Cycle	
Week - 6		Test-Driven Development (TDD) 2: Scenario-Oriented Coding, Equivalence Classes, and Boundary Value Analysis	
Week - 7		Test Infrastructure: Fixture Architecture, Preparation of Test Environments, and Test Database Management	
Week - 8		Midterm Exam	
Week - 9		Code Coverage Analysis: Code Coverage Metrics, Branch Coverage, and Analysis Reporting	
Week - 10		API Testing: Testing REST/GraphQL Endpoints, Status Codes, and Parametric Data Validation	
Week - 11		Error and Exception Testing: Negative Scenarios, Unexpected State Management, and Simulation of Error Scenarios	
Week - 12		Introduction to End-to-End (E2E) Testing: Simulation of User Scenarios and User Interface (UI) Test Automation	
Week - 13		Code Quality: Static Code Analysis (SonarQube, etc.), Technical Debt, and Code Refactoring Processes	
Week - 14		Continuous Integration (CI) and Pipeline Management: Integration of Test Automation into CI Environments and End-of-Term Projects	

Learning Outcomes

#	Learning Outcome
1	Upon successful completion of this course, students will reach the competence to design unit, integration, and end-to-end test scenarios using dependency isolation and mock objects by adopting software quality assurance principles; apply Test-Driven Development (TDD) practices with the Red-Green-Refactor cycle; measure software reliability by conducting boundary value analyses with API and error tests; manage test infrastructure and test databases professionally by effectively using code coverage analysis tools; and develop sustainable, high-quality software products by establishing test automation in continuous integration (CI) pipelines and applying static code analysis processes.

Sustainable Development Goals

No content has been provided.

Course Theme

No content has been provided.

AKTS Workload

Activity	Duration (Hour)	Count	Workload
Teorik Derse Katılım	0	0	0
Sınıf Dışı Çalışma (Ön Hazırlık & Pekiştirme Amaçlı)	0	0	0
Ödevler	0	0	0
Proje - Rapor - Sunum Hazırlama	0	0	0
Ara Sınav Hazırlığı (sınav süresi dahil)	0	0	0
Final Sınavı Hazırlığı (sınav süresi dahil)	0	0	0
Uygulama (Laboratuvar, Müzik/Enstrüman Uygulaması, Atölye/Saha Çalışması vb.)	0	0	0
Staj Uygulaması	0	0	0
		Calculated ECTS	**0**

Assessment Method and Passing Requirements

No content has been provided.