Course Syllabus

Code - Course Title	**AYG120 - Web Services Design and Development**
Course Type	II. SEMESTER
Laboratory + Practice	3+2
ECTS	**4.0**
Language of Instruction	Türkçe
Course Type	Required Courses

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		Introduction to Web Services: Backend Architectures and Comparison of REST, GraphQL, gRPC	
Week - 2		RESTful Resource Design: HTTP Methods, Status Codes, and URL Structuring	
Week - 3		Contract-First Development: OpenAPI Specification and Using Swagger	
Week - 4		API Security 1: Authentication Fundamentals and JWT (JSON Web Tokens) Integration	
Week - 5		API Security 2: Advanced Authorization and OAuth2 / OIDC Protocols	
Week - 6		API Security 3: Rate Limiting, CORS Management, and Input Validation	
Week - 7		API Testing and Debugging: Using Postman and Automated Testing Strategies	
Week - 8		Midterm Exam	
Week - 9		External API Integration: Webhook Design, Data Consumption, and Error Handling	
Week - 10		Modern Architectures: Introduction to Microservices and the API Gateway Concept	
Week - 11		API Lifecycle: Versioning Strategies and Automated Documentation Generation	
Week - 12		Monitoring and Analytics: Logging Practices, Latency, and Error Rate Tracking	
Week - 13		Scaling and Performance: Caching, Load Balancing, and Database Optimizations	
Week - 14		End-to-End API Project: Development of Student Projects and End-of-Term Presentations	

Learning Outcomes

#	Learning Outcome
1	Upon successful completion of this course, students will gain the competence to design contract-first APIs with OpenAPI/Swagger tools by understanding different web service architectures like REST, GraphQL, and gRPC; establish secure authentication and authorization mechanisms using JWT and OAuth2/OIDC standards; apply security measures such as rate limiting, CORS, and input validation in developed APIs; grasp microservices architectures and API Gateway concepts to professionally execute testing, debugging, external service integration, versioning, and logging/monitoring processes; and ultimately develop scalable, high-performance back-end systems end-to-end on an applied project.

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.