هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification

(Bachelor)

Course Title:	Advanced Web Applications Development
Course Code:	SE3601
Program:	BSc in Software Engineering
Department:	Software Engineering
College:	College of Computing
Institution:	Umm Al Qura University
Version:	1.0
Last Revision Date:	22/04/2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☐ Required		☒ Elective		
3. Level/year at which this course is offered: (3rd year/ 5th or 6th level) or (4th year/8th level)					
4. Course General Description:					
This course explores advanced concepts and techniques in modern web application development. Students will learn to design and implement high-performance, scalable, and secure web applications using state-of-the-art frameworks and technologies. Topics include microservices, cloud integration with Azure, web security, and real-time data processing. The course emphasizes industry best practices for enterprise-level web applications.					
5. Pre-requirements for this course (if any):					
SE2301 - Software Modelling and Analysis					
6. Co-requisites for this course (if any):					
7. Course Main Objective(s):					
Upon successful completion of this course, you will be able to: • Prepare students with the expertise required to design and develop advanced web applications utilizing state-of-the-art technologies within the .NET ecosystem • Enable students to understand and apply enterprise-level development practices, including front-end and back-end integration. • Foster expertise in securing, deploying, and scaling applications in cloud environments.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning	0	0
3	Hybrid	0	0

No	Mode of Instruction	Contact Hours	Percentage
	• Traditional classroom • E-learning		
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain advanced web application concepts, including PWAs and microservices architecture.	K1	Lectures, Discussions	Written Exams, Quizzes
1.2	Identify modern frameworks and cloud services for scalable application development.	K1	Lectures, Case Studies	Midterm, Final Exam
2.0	**Skills**			
2.1	Develop complex front-end interfaces using modern frameworks (e.g., Blazor and ASP.NET Core).	S1	Hands-on Labs, Projects	Assignments, Project Evaluation
2.2	Implement secure and efficient back-end systems with API integrations.	S2	Hands-on Labs, Projects	Quizzes, Projects

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.3	Deploy web applications using CI/CD pipelines and containerization.	S1	Practical Demos, Labs	Lab Reports, Projects
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate responsibility in collaborative web application development projects.	V1	Group Projects, Peer Reviews	Project Reports, Presentations
3.2	Function effectively in a team to design and implement web applications, demonstrating leadership and collaborative skills.	V2	Group Projects	Project Reports, Peer Evaluation

C. Course Content

No	List of Topics	Contact Hours
1	Advanced Web Application Architecture	4
2	Introduction to ASP.NET Core and .NET Framework	4
3.	Front-End Development with Blazor and Razor Pages	8
4.	Building and Managing APIs with ASP.NET Core	4
5.	Entity Framework Core: Database Integration and ORM	8
6.	Microservices Architecture in ASP.NET Core	4
7.	Web Security Practices in ASP.NET (OAuth2, JWT, CSRF Prevention)	4
8.	Real-Time Data Processing with SignalR	4
9.	Cloud Integration with Microsoft Azure	4
10.	CI/CD Pipelines for ASP.NET Applications	4
11.	Containerization with Docker and Orchestration with Kubernetes	4
12.	Performance Testing and Optimization	4
13.	Capstone Project Presentation and Peer Review	4
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	**Assignments and Quizzes**	**2-14**	**10**
2	**Projects**	**2-14**	**30**
3	**Mid Term**	**7**	**20**
4	**Final Exam**	**16-17**	**40**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• Andersson, J. C. (2023). *Learning Microsoft Azure: Cloud computing and development fundamentals*. O'Reilly Media. ISBN 978-1098113322.
Supportive References	• Ivey, P., & Ivanov, A. (2022). *Developing solutions for Microsoft Azure AZ-204 exam guide* (2nd ed.). Packt Publishing. ISBN 978-1835085295.
Electronic Materials	• Microsoft. (n.d.). *Microsoft Learn: ASP.NET Core and Azure tutorials*. Retrieved from https://learn.microsoft.com/en-us/aspnet/core/getting-started/?view=aspnetcore-9.0
Other Learning Materials	• Dwarkani, B. (n.d.). *GitHub repositories with real-world ASP.NET projects*. Retrieved from https://github.com/bharatdwarkani/awesome-dotnet-core-applications

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Traditional Classroom
Technology equipment (projector, smart board, software)	Multimedia Projector
Other equipment (depending on the nature of the specialty)	N/A

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct, Indirect
Effectiveness of Students' assessment	Faculty, Peer reviewer	Direct, Indirect
Quality of learning resources	Faculty, Course coordinator	Direct, Indirect
The extent to which CLOs have been achieved	Course coordinator, Program management committee	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**SOFTWARE ENGINEERING DEPARTMENT COUNCIL**
REFERENCE NO.	**THE 17TH MEETING FOR THE ACADEMIC YEAR 1446H**
DATE	**22/04/2025**