



Course Specification

(Bachelor)

Course Title: **Selected Topics in Software Engineering**

Course Code: **SE4705**

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**



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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 and emerging topics in software engineering, providing students with a broad understanding of cutting-edge practices, tools, and challenges in the field. The course is designed to cover a dynamic selection of topics reflecting the latest trends and innovations in software engineering. Students will engage with contemporary issues such as DevOps, microservices architecture, software sustainability, AI-driven software development, and the social and ethical implications of software engineering.

5. Pre-requirements for this course (if any):

SE2301 - Software Modelling and Analysis

6. Co-requisites for this course (if any):

N/A

7. Course Main Objective(s):

Upon successful completion of this course, you will be able to:

1. Expose students to advanced concepts and emerging trends in software engineering.
2. Equip students with practical skills for applying modern tools and techniques in software development.
3. Foster critical thinking about ethical and societal impacts of software engineering practices.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning	0	0
3	Hybrid	0	0



No	Mode of Instruction	Contact Hours	Percentage
	<ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
Total		45

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	Understand key principles of selected advanced topics in software engineering.	K2	Lectures	Assignments, Exams
1.2	Learn about emerging trends and innovations shaping the software industry.	K1	Lectures	Assignments, Exams
1.3	Explore ethical and sustainability considerations in software development.	K1	Lectures	Assignments, Exams
2.0	Skills			
2.1	Apply modern software engineering practices such as DevOps and CI/CD.	S3	Lectures	Assignments, Exams
2.2	Design and implement scalable systems using microservices architecture.	S2	Lectures	Assignments, Exams
2.3	Integrate AI-driven tools into the software development lifecycle.	S1	Lectures	Assignments, Exams



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.4	Analyze and address contemporary software engineering challenges.	S1	Lectures	Assignments, Exams
3.0	Values, autonomy, and responsibility			
3.1	Commit to sustainable and ethical software engineering practices.	V1	Project	Assignment, project
3.2	Embrace continuous learning to stay current with industry advancements.	V2	Project	Assignment, project

C. Course Content

No	List of Topics	Contact Hours
1.	Emerging Trends in Software Engineering - Overview of current trends in software engineering - Impact of emerging technologies on software development	6
2.	DevOps and Continuous Integration/Continuous Deployment (CI/CD) - Principles and practices of DevOps - Tools for CI/CD (e.g., Jenkins, GitHub Actions, GitLab CI)	6
3.	Microservices Architecture - Designing scalable and maintainable systems - Tools and frameworks for microservices (e.g., Docker, Kubernetes, Spring Boot)	6
4.	AI-Driven Software Development - AI-powered tools for code generation and testing - Applications of machine learning in software development	6
5.	Software Sustainability - Principles of sustainable software development - Reducing energy consumption and improving efficiency in software systems	6
6.	Social and Ethical Implications of Software Engineering - Ethical considerations in software design and development - Addressing bias and promoting fairness in software systems	6
7.	Emerging Software Development Paradigms - Event-driven and serverless computing - Domain-driven design (DDD)	6





8.	Case Studies in Modern Software Engineering: - Real-world applications and lessons learned	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	2-14	15
2.	Projects	2-14	15
3.	Assignments	2-14	10
4.	Mid Term	7	20
5.	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	
Supportive References	<ul style="list-style-type: none"> Newman, S. (2021). <i>Building microservices: Designing fine-grained systems</i> (2nd ed.). O'Reilly Media. ISBN 978-1492034025. Forsgren, N., Humble, J., & Kim, G. (2018). <i>Accelerate: The science of lean software and DevOps: Building and scaling high performing technology organizations</i>. IT Revolution Press. ISBN 978-1942788331. Abbott, M. L., & Fisher, M. T. (2015). <i>The art of scalability: Scalable web architecture, processes, and organizations for the modern enterprise</i> (2nd ed.). Addison-Wesley Professional. ISBN 978-0134032801.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Traditional Classroom





Items	Resources
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

