جامعة الزيتونة الأردنية

Al-Zaytoonah University of Jordan

Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name: Software Engineering

Course Number: 0130103

General Course Information:

Course Title	Software Engineering
Course Number	0130103
Credit Hours	3 credit hours
Education Type	Traditional learning
Prerequisites/Co-requisites	Fundamentals of Information Technology
Academic Program	Computer Science
Program Code	112
Faculty	Faculty of Science and IT
Department	Computer Science
Level of Course	1
Academic Year /Semester	2024/2025 (2nd Semester)
Awarded Qualification	Bachelor's degree
Other Department(s) Involved in Teaching the Course	N/A
Language of Instruction	English
Date of Production/Revision	2024-2025
	28/04/2025
	Traditional learning
	N/A

Course Coordinator:

Coordinator's Name	Dr. Mohammad Al-Madi
Office No.	9114
Office Phone Extension Number	430
Office Hours	11:00 to 14:00 and 15:30 to 17:00 (Monday) 13:00 to 14:00 and 15:30 to 16:00 (Wednesday)
E-mail	m.almadi@zuj.edu.jo

Other Instructors:

Instructor Name	Dr. Mohammad Abdullah
Office No.	9357
Office Phone Extension Number	469
Office Hours	11:00 to 12:30 (Sunday till Thursday)
Email	m.abdallah@zuj.edu.jo

Course Description *(English/Arabic)*:

English	*This module introduces the methodologies, principles, and best practices used in the development of high-quality software systems. Topics include software development life cycles, requirement analysis, system design, implementation, testing, and maintenance. Students will learn about Agile and Waterfall methodologies, project management, and version control systems. The course emphasizes teamwork and collaboration through group projects simulating real-world software development scenarios. By the end of the module, students will understand how to deliver efficient, reliable, and maintainable software solutions that meet user and organizational needs.*

Arabic	تقدم هذه المادة منهجيات ومبادئ وأفضل الممارسات المستخدمة في تطوير أنظمة البرمجيات عالية الجودة. تشمل الموضوعات دورات حياة تطوير البرمجيات، تحليل المتطلبات، تصميم الأنظمة، التنفيذ، الاختبار، والصيانة. سيتعرف الطلاب على منهجيات Agile وWaterfall، وإدارة المشاريع، وأنظمة التحكم بالإصدارات ،يركز المقرر على العمل الجماعي والتعاون من خلال مشاريع جماعية تحاكي سيناريوهات تطوير البرمجيات في العالم الواقعي. بنهاية المادة، سيكون لدى الطلاب فهم لكيفية تقديم حلول برمجية فعالة وموثوقة وقابلة للصيانة تلبي احتياجات المستخدمين والمنظمات.

Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

Varela, Cristina, ed. *Introduction to Software Engineering*. 2nd ed. New York: 3G E-Learning, 2024. ISBN 9781984688545.

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

1- Rajlich, V., 2024. Software engineering: The current practice. 2nd ed. Boca Raton: Chapman and Hall/CRC.
2- Tsui, F., Karam, O. and Bernal, B., 2022. Essentials of software engineering. 5th ed. Burlington: Jones & Bartlett Learning.
3- Sommerville, I., 2021. Software engineering. 10th ed. Harlow: Pearson Education.
4- Pressman, R.S. and Maxim, B.R., 2020. Software engineering: A practitioner's approach. 9th ed. New York: McGraw-Hill Education.

Course Educational Objectives (CEOs):

1.	Understand and Apply Software Development Life Cycle (SDLC) Models.
2.	Develop Problem-Solving and Analytical Skills.
3.	Learn Requirements Engineering and Management.
4.	Master Software Design, Testing, and Quality Assurance.

Intended Learning Outcomes (ILO's):

Intended learning outcomes (ILOs)		**Relationship to CEOs**	**Contribution to PLOs**	**Bloom Taxonomy Levels***	**JNQF Descriptors****
K- Knowledge and Understanding					
ILO1-K	A student will be able to understand and discuss the needs, goals, views, and tasks for software engineering and its activities.	CEO1	PLO2-K, PLO5-C	Understanding	K, C
ILO2-K	A student will understand basic software engineering approaches for requirements, design, coding, testing, maintenance, and quality assurance.	CEO4	PLO2-K, PLO5-C	Understanding	K, C
S- Intellectual skills					

ILO3-S	A student will be able to elicit and document problem requirements and to create an architecture to solve a problem.	CEO3	PLO3-S, PLO5-C	Creating	S, C
ILO4-S	A student will be able to follow a code of ethics and to apply the object-oriented methodology in software.	CEO2	PLO1-K, PLO4-S	Applying	K, S
	C- Competencies				
ILO5-C	A student will plan and track software development efforts.	CEO1	PLO6-C, PLO7-D	Applying and analyzing	C, D

*Bloom Taxonomy Levels:

Level #	1	2	3	4	5	6
Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

** Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.

Program Learning Outcome (PLOs):

(PLOs)		JNQF Descriptors**		
		K	**S**	**C**
PLO1-K	Knowledge of professional ethics, social responsibility, and the regulations governing.	√		
PLO2-K	Understanding various programming techniques, the stages of software development, and the fundamental principles of security.	√		
PLO3-S	Skill in applying mathematical concepts to analyze and design algorithms and verify their correctness.		√	
PLO4-S	Skill in using different programming languages and applying them to develop software and computer applications.		√	
PLO5-C	The ability to analyze, design, and develop effective and reliable computer programs that meet users' requirements and adhere to professional ethics.			√
PLO6-C	The ability to keep up with continuous advancements in computer science, innovate, and work independently or as part of a team.			√
PLO7-D	The ability to work collaboratively, communicate effectively, and demonstrate teamwork spirit.			√

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule *(please choose the type of teaching)*

- ☐ **Face to Face (F2F)**
- ☒ **Hybrid** *(One – To - One)*
- ☐ **Online**

Schedule of Simultaneous and their Topics:

Week	First Lecture (F2F)	Second Lecture (F2F)	ILOs	PLOs	JNQF Descriptors*
1	**Introduction** 1.1 Professional	N/A	ILO1-K, ILO4-S	PLO1-K, PLO2-K, PLO4-S,	K, S, C

	software development			PLO5-C	
2	1.2 Software engineering ethics	N/A	ILO4-S	PLO1-K, PLO4-S	K, S
3	1.3 Case studies	N/A	ILO1-K, ILO4-S, ILO5-C	PLO1-K, PLO2-K, PLO4-S, PLO5-C, PLO6-C, PLO7-D	K, S, C, D
4	**Software process** 2.1 Software process models	N/A	ILO1-K, ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
5	2.2 Process activities	N/A	ILO1-K, ILO2-K, ILO3-S, ILO5-C	PLO2-K, PLO3-S, PLO5-C, PLO6-C, PLO7-D	K, S, C, D
6	2.3 Coping with change	N/A	ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
7	2.4 The rational unified process	N/A	ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
8	**Agile software development** 3.1 Agile methods	N/A	ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
9	3.2 Plan-driven and agile development	N/A	ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
10	3.3 Extreme programming	N/A	ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
11	3.4 Agile project management 3.5 Scaling agile methods	N/A	ILO2-K, ILO5-C	PLO2-K, PLO5-C, PLO6-C, PLO7-D	K, C, D
Review of previous chapters - Midterm Exam (30%)					
13	**4 Requirements engineering 82** 4.1 Functi onal and	N/A	ILO2-K, ILO3-S	PLO2-K, PLO3-S, PLO5-C	K, S, C

	non-functional requirements 84				
14	4.2 The software requirements document 4.3 Requirements specification	N/A	ILO2-K, ILO3-S	PLO2-K, PLO3-S, PLO5-C	K, S, C
15	4.4 Requirements engineering processes 4.5 Requirements elicitation and analysis 4.6 Requirements validation 4.7 Requirements management	N/A	ILO2-K, ILO3-S	PLO2-K, PLO3-S, PLO5-C	K, S, C
16	**Final Exam**				

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Lecture.
- flipped learning.
- learning through projects.
- learning through problem solving and case studies.
- participatory learning.

Course Policies:

A- Attendance policies:
The maximum allowed absences is 15% of the lectures.
B- Absences from exams and handing in assignments on time:
Midterm exam can be retaken based on approval of excuse by the instructor's discretion.
Not handing assignment on time will incur penalties.
C- Academic Health and safety procedures
D- Honesty policy regarding cheating, plagiarism, and misbehaviour:
Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.
E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20%**
- Midterm 30**%**
- Final Exam 50**%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required Equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the ZUJ E-Learning Platform at https://exams.zuj.edu.jo/
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools Implemented in the Course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching.
- Others…

Responsible Persons and their Signatures:

Course Coordinator	**Dr. Mohammad Al-Madi**	**Completed Date**	**28 / 04 / 2025**
		Signature	
Received by (Department Head)		**Received Date**	/ /
		Signature	