جامعة الزيتونة الأردنية

Al-Zaytoonah University of Jordan

Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name:
Cloud Computing and Distributed

Course Number: 0130424

General Course Information:

Course Title	Cloud Computing and Distributed Systems
Course Number	0130424
Credit Hours	3
Education Type	Blended
Prerequisites/Co-requisites	نظم التشغيل Operating Systems
Academic Program	Computer Science
Program Code	130
Faculty	Science and Information Technology
Department	Computer Science
Level of Course	4
Academic Year /Semester	2024/2025
Awarded Qualification	BSc
Other Department(s) Involved in Teaching the Course	
Language of Instruction	English
Date of Production/Revision	11/11/2025

Course Coordinator:

Coordinator's Name	Ali Al Dahoud
Office No.	332
Office Phone Extension Number	346
Office Hours	11-13
E-mail	aldahoud@zuj.edu.jo

Other Instructors:

Instructor Name	
Office No.	
Office Phone Extension Number	
Office Hours	
Email	

Course Description *(English/Arabic)*:

English	**This module explores the principles and technologies of cloud computing and distributed systems. Topics include distributed architectures, virtualization, cloud service models (IaaS, PaaS, SaaS), and scalability. Students will learn about distributed algorithms, data consistency, fault tolerance, Load Balancing, and security in distributed environments.**
Arabic	**تستكشف هذه المادة مبادئ وتقنيات الحوسبة السحابية والأنظمة الموزعة. تشمل الموضوعات الهياكل الموزعة، الافتراضية(Virtualization) ، نماذج خدمات السحابةIaaS ، PaaS، SaaS)، وقابلية التوسع. سيتعلم الطلاب عن الخوارزميات الموزعة، تناسق البيانات، تحمل الأخطاء، والأمان في البيئات الموزعة. يغطي المقرر أيضًا منصات الحوسبة السحابية مثلAWS ، Microsoft Azure، أوGoogle Cloud ، وتطبيقاتها العملية. من خلال مشاريع عملية، سيقوم الطلاب بنشر وإدارة حلول قائمة على السحابة، مما يمنحهم فهماً لكيفية دعم الأنظمة الموزعة للحوسبة الحديثة ومعالجة البيانات الكبيرة.**

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

Distributed and Cloud Computing
Distributed Systems: Principles and Paradigms, 3rd edition, Andrew S. Tanenbaum
Distributed and Cloud Computing, by Kai Hwang, Jack Dongarra, Geoffrey C. Fox
https://www.oreilly.com/library/view/distributed-and-cloud/9780123858801/

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

Distributed Systems: Concepts and Design 5th Edition, by George Coulouris (Author), Jean Dollimore
Cloud Computing Theory and Practice

Parallel and Distributed Systems in Cloud Computing,
https://phdtopic.com/parallel-and-distributed-systems-in-cloud-computing/

Course Educational Objectives (CEOs):

CEO1	**To learn the principles, architectures, algorithms, techniques and programming models used in distributed systems**
CEO2	Describe the key concepts and technologies in cloud computing
CEO3	Evaluate cloud computing technologies and platforms

Intended Learning Outcomes (ILO's):

Intended learning outcomes (ILOs)		**Relationship to CEOs**	**Contribution to PLOs**	**Bloom Taxonomy Levels***	**JNQF Descriptors****
1. K	Knowledge and Understanding				
2. ILO1-K	Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.	CEO1	PLO2-K	Remembering	K
3. ILO2-K	Students will gain an understanding of the principles and techniques behind the design of distributed systems, such as locking, concurrency, scheduling, and communication across networks. Second, students will gain practical experience in designing, implementing, and debugging real distributed systems	CEO1	PLO2-K	Understanding	K
S	Intellectual Skills				
4. ILO3-S	Design, implement, and deploy cloud applications for cloud platforms	CEO2	PLO3-S	Applying	S
5. ILO4-S	Assess and monitor resource use of applications in virtualized environments	CEO2	PLO3-S	Applying	S
C	Competencies				
6. ILO5-C	Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will	CEO3	PLO6-C	Evaluating	C

	additionally apply these concepts to develop sample systems. Examine how modern distributed systems meet the demands of contemporary distributed applications				
7. D	Transferable Skills				
8. ILO6-D	Students will learn about process distribution and communication, data distribution, scheduling, concurrency, resource sharing, synchronization, Load balancing, failure handling,	CEO3	PLO6-C	Creating	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 them.	X		
PLO2-K	Understanding various programming techniques, the stages of software development, and the fundamental principles of security.	X		
PLO3-S	Skill in applying mathematical concepts to analyze and design algorithms and verify their correctness		X	
PLO4-S	Skill in using different programming languages and applying them to develop software and computer applications.		X	
PLO5-C	The ability to analyze, design, and develop effective and reliable computer programs that meet user requirements and adhere to professional ethics.			X
PLO6-C	The ability to keep up with continuous advancements in computer science, innovate, and work independently or as part of a team.			X
PLO7-D	The ability to work collaboratively, communicate effectively, and demonstrate teamwork spirit.			X

**** 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)

x **Hybrid** *(One-To-One)*

□ **Online**

Schedule of Simultaneous and their Topics:

Week	First Lecture (F2F)	Second Lecture (Activity)	ILOs	PLOs	JNQF Descriptors*
1	Introduction to Parallel and Distributed Systems	Introduction to Parallel and Distributed Systems	ILO1	PLO2	K
2	Introduction to Parallel and Distributed Systems	Introduction to Parallel and Distributed Systems	ILO2	PLO2	K
3	DS: Design Goals	DS: Design Goals	ILO2	PLO2	K

4	Types of Distributed Systems	Types of Distributed Systems	ILO5	PLO4	S
5	Types of Distributed Systes	Types of Distributed Systems	ILO5	PLO4	S
6	DS: Architectures	DS: Architectures	ILO5	PLO4	S
7	DS: Design Goals	DS: Design Goals	ILO5	PLO4	S
Midterm Exam (30%)					
9	Fault Tolerance	Fault Tolerance	ILO5	PLO4	S
10	Load Balancing	Load Balancing	ILO4	PLO4	S
11	Load Balancing	Load Balancing	ILO3	PLO3	S
12	Cloud Service providers a	Cloud Service providers a	ILO3	PLO3	S
13	Cloud Service providers a	Cloud Service providers a	ILO6	PLO5	C
14	Cloud Data Storage	Cloud Data Storage	ILO7	PLO6	C
15	**Projects Discussion**				
16	**Final Exam**				

Week	First Lecture (F2F)	Second Lecture (Activity)	ILOs	PLOs	JNQF Descriptors*
1	Introduction to Parallel and Distributed Systems	Introduction to Parallel and Distributed Systems	ILO1	PLO2	K
2	Introduction to Parallel and Distributed Systems	Introduction to Parallel and Distributed Systems	ILO2	PLO2	K
3	DS: Design Goals	DS: Design Goals	ILO2	PLO2	K
4	Types of Distributed Systems	Types of Distributed Systems	ILO5	PLO4	S
5	Types of Distributed Systes	Types of Distributed Systems	ILO5	PLO4	S
6	DS: Architectures	DS: Architectures	ILO5	PLO4	S
7	DS: Design Goals	DS: Design Goals	ILO5	PLO4	S
Midterm Exam (30%)					
9	Fault Tolerance	Fault Tolerance	ILO5	PLO4	S
10	Load Balancing	Load Balancing	ILO4	PLO4	S
11	Load Balancing	Load Balancing	ILO3	PLO3	S
12	Cloud Service providers a	Cloud Service providers a	ILO3	PLO3	S
13	Cloud Service providers a	Cloud Service providers a	ILO6	PLO5	C
14	Cloud Data Storage	Cloud Data Storage			
15	**Projects Discussion**				
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.
- 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 misbehavior:
Cheating, plagiarism, misbehavior 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.
- Activities (Course Videos, Homework, Quizzes, Project) 30**%**
- Midterm 30**%**
- Final Exam 40%

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

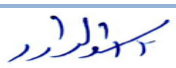
Required Equipment:

- 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 (Optional), Homework**
- Project / Presentation

Responsible Persons and their Signatures:

Course Coordinator	Ali Al Dahoud	**Completed Date**	**12/ 11 / 2025**
		Signature	
Received by (Department Head)		**Received Date**	/ /
		Signature	