QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department

Study plan No.	**2021/2022**		**University Specialization**		**Software Engineering**		
Course No.	**0114497**		**Course name**		**Cloud Computing and Big Data**		
Credit Hours	**3**		**Prerequisite Co-requisite**		**Database Management**		
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	✓ Mandatory requirements	☐ Elective requirements	
Teaching style	☐ **Full online learning**		☐ **Blended learning**		✓**Traditional learning**		
Teaching model	✓**2Synchronous: 1asynchronous**		☐ **2 face to face : 1synchronous**		☐ **3 Traditional**		

Faculty member and study divisions information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Wael Alzaydat	**Assistant Professor**			**Wael.alzyadat@zuj.edu.jo**	
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**

Brief description

This course is a capstone Artificial Intelligent (AI), Web3 Decentralized Applications technologies and Big Data that can be combined the emerging technology. Students will learn about principles, processes, and techniques for understanding phenomena via the (automated) analysis of data., Students will learn refer to cloud term the computing and hosting services, storage services, networking services, big data services, and machine/deep learning services.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	Cloud Computing for Science and Engineering, Ian Foster, Dennis B. Gannon, 2017, MIT press.			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1 Google's Datalab 2 R- programming language 3 Orange			
Supporting websites	Big Clouds websites (e.g., azure.microsoft.com, aws.amazon.com, cloud.google.com, cloud.ibm.com, force.com)			
The physical environment for teaching	✓ Class room	✓ labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software	1 R- programming language 2 Orange			
Supporting people with special needs				

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For technical support	

Course learning outcomes (S= *Skills, C= Competences K= Knowledge,)*

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	Capacity for knowing and understanding a database steps by different scales	Mk3, Mk4
K2	Use appropriate models for solution development	Mk2, Mk3
K3	Choose appropriate strategy to analyze the problems such as problem decomposition and abstraction	Mk1,Mk5,
K4	Develop understanding of general concepts of Data Base, object-oriented programming, functional programming, and Data Analytics	Mk2, Mk4, Mk5
	Skills	
S1	Understand general concepts of database system, database architecture, conceptual modeling, ER modeling, relational modeling, and transaction processing	Ms1 ,Ms4
S2	Choose an appropriate data structure such as stack, queue, binary tree, or graph required to solve a problem	Ms2,Ms3, Ms4
S3	Identify the components of conceptual solutions such as entities, relationships, attributes, data integrity and security requirements	Ms2
	Competences	
C1	Understand Computer networks and distributed systems through the process aspects and services aspects	Mc2
C2	students to the Cloud landscape and its service and deployment models	Mc1
C3	Lead by taking responsibility for various tasks Big Data stages via cloud platform	Mc1, Mc2
C4	Use appropriate cloud platform for deployment	Mc2,Mc3

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm exam	30%	30%	**40%**	30%
Participation / practical applications	0	0	**10%**	30%
Asynchronous interactive activities	30%	30%	**0**	0
Final exam	40%	40%	**50%**	40%

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Note: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	Cloud Principles (introduce students to the Cloud landscape and its service and deployment models)	Lecture	1-16
2	Managing Data in the Cloud (Cloud Storage Services)	Lecture	20-36
3	Cloud-Based Computing and Hosting Services	learning through projects	37-57
4	CosmosDB Planet-Scale Database	learning through problem solving	https://esciencegroup.com/2017/07/31/azures-new-cosmosdb-planet-scale-database/
5	Computing in the Cloud	Lecture	64-71
6	Using and Managing Virtual Machines	Lecture	73-84
7	Scaling Deployments (to scale Cloud deployments via HPC, MapReduce, Graph Dataflow Execution, Agents and Microservices)	Lecture	96-129
8	Cloud Networking Services and Service Platform Design	learning through projects	129-135
9	Data analytics	learning through projects	136-159
10	Streaming data services	learning through projects	162-190
11	Machine learning services	learning through projects	192-223
12	Globus platform services	Lecture	226-255
13	eucalyptus	participatory	https://www.eucalyptus.cloud/

		learning	
14	eucalyptus	participatory learning	https://www.eucalyptus.cloud/
15	eucalyptus	participatory learning	https://www.eucalyptus.cloud/
16	**Final Exam**		

*** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.**

**** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.**

Schedule of asynchronous interactive activities (in the case of e-learning and blended learning)

Week	Task / activity	Reference	Expected results
1	Learn how to access the Cloud via Big Cloud vendors' websites	https://jupyter.org/	familiar with Cloud services
2	Migrate a legacy storage structure to the various Big Clouds using the appropriate storage models and structures	cloud.google.com	Building own cloud
3	Google's Cloud	cloud.google.com/sdk/	Students will learn about computing as a service,
4	Google's Cloud	cloud.google.com/sdk/	service platforms
5	Google's Cloud	cloud.google.com/sdk/	service platforms
6	Google's Cloud	cloud.google.com/sdk/	using/managing virtual machines
7	Google's Cloud	cloud.google.com/sdk/	using/managing virtual machines
8	Google's Cloud	cloud.google.com/sdk/	docker containers
9	Google's Cloud	cloud.google.com/sdk/	docker containers
10	Google's Cloud	cloud.google.com/sdk/	docker containers
11	Jupyter	Jupyter.com	Computing as a Service
12	Jupyter	Jupyter.com	Data Analytics
13	Jupyter	Jupyter.com	Visualization
14	Jupyter	Jupyter.com	Streaming data
15	Jupyter	Jupyter.com	Select the right methods
16	Jupyter	Jupyter.com	Define the output