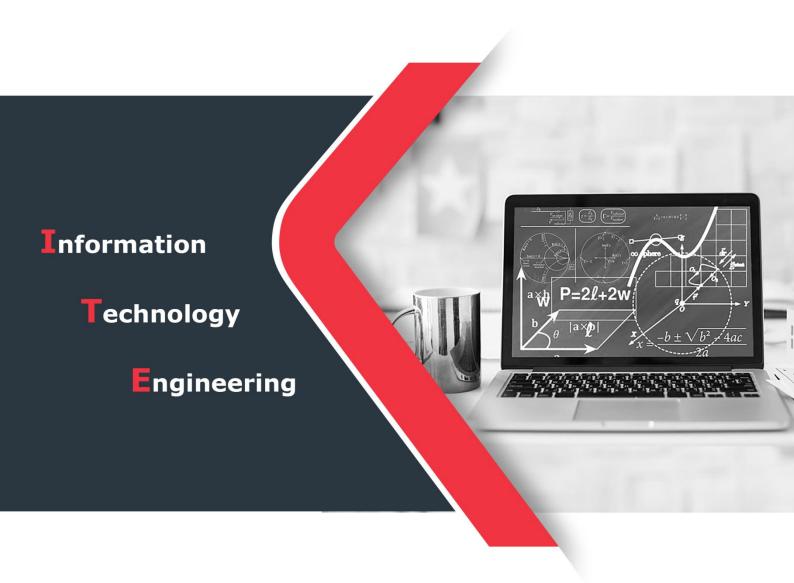


Course Definition

Distributed & Cloud Systems





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Syrian Virtual University	الجامعية الإفتراضيية السوريية Syrian Virtual University	الجامعة الافتراضية السورية

1. Basic Information:

Course Name	Distributed & Cloud Systems
Course ID	NDS601
No. of Recorded Sessions*	12
No. of Synchronized Sessions*	12
No. of Quizzes (hrs.)	2
Exam (hrs.)	1
Registered Sessions Work Load (hrs.)	36
Synchronized Sessions Work Load (hrs.)	36
Credit Hours	4

^{*} The duration of each session 1.5 hr

2. Pre-Requisites:

Course	ID
Operating Systems II	NOS601

3. Course Objectives:

This course introduces the techniques underlying the design and engineering of distributed and cloud computing systems. Topics include distributed system models, cloud computing models, cloud-enabling technologies. Students will also acquire experience in techniques and algorithms used to overcome the challenges of distributed system, an introduction to RMI and CORBA, logical time notion and coordination mechanisms.

4. Learning Outcomes (LO):

By the end of this course the learner is expected to:

Define and Describe distributed systems and cloud computing.

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- Understand the concept of Inter-Process Communication and Middleware.
- Acquire knowledge of synchronization in distributed systems and the concept of logical clocks.
- Describe and distinguish different coordination techniques and algorithms in distributed systems.

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5. Assessment Results:

				Asses	sment T	ype	
Chapt er No.	Chapter Title	Intended Objectives	Develo ped conten t/ Record ed Sessio ns	Practical Activities (Synchro nized Sessions	Quizz es and Exam s	Present ations And Intervie ws	Repo rts
CH1		Comprehension					
	Introduction	-Analytical					
	to Distributed	Thinking -Tools	X	X	X	X	X
	Systems	and Application					
		Hands- On					
CH2	Cloud Computing	Comprehension -Analytical Thinking -Tools And Application Hands- On	X	X	X	X	X
CH3	Inter-Process Communicatio n (IPC)	Comprehension -Analytical Thinking -Tools And Application Hands- On	X	X	X	X	X

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CH4		Comprehension					
	Time and	-Analytical					
	Clocks in DS	Thinking -Tools	X	X	X	X	X
	CIOCKS III DO	And Application					
		Hands- On					
CH5		Comprehension					
	Coordination	-Analytical					
	in DS	Thinking -Tools	X	X	X	X	X
	III D3	And Application					
		Hands- On					

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6. Course Syllabus

Chapter No.	Chapter Title	Chapter Content (Syllabus)	No. of Theoretic al Learning Units	No. of Practical Learning Units)
CH1	Introduction to Distributed Systems	 Definition of DS. Main Characteristics. Design Issues. Types of DS. 		
CH2	Cloud Computing	 Key Characteristics. Cloud Service Offering Types. Cloud Computing Technologies. Cloud Deployment Models. 		
CH3	Inter- Process Communicati on (IPC)	 Middleware. Data Representation. Remote Procedure Call (RPC). Remote Method Invocation (RMI). Distributed Software Examples. 		
CH4	Time and Clocks in DS	 Synchronization and Event Ordering. Clock Synchronization Algorithms. Physical Clock Synchronization Algorithms. 	2	2

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		4. Logical Clocks.	
		5. Lamport Algorithm.	
		6. Vector Algorithm.	
		Mutual exclusion and Preliminaries	
		2. Design of Distributed Mutual	
	Coordination	Exclusion Algorithms.	
CH5	in DS	3. The Central Coordination Algorithm	
	III D3	4. The Token Ring-Based Algorithm	
		5. Ricart-Agrawala Algorithm.	
		6. Quorum-Based Algorithms	

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7. Practical Activity:

Tools and Labs:

Tool Name	Description

8. References:

- 1- Distributed Systems, Third edition, Maarten van Steen and Andrew S. Tanenbaum, Pearson Education, 2018.
- **2**-DISTRIBUTED SYSTEMS, Concepts and Design, Fifth Edition, Coulouris et al, Pearson Education, 2012.