الجامعة الافتراضية السورية
SYRIAN VIRTUAL UNIVERSITY

Course Definition

Distributed & Cloud Systems

Information

Technology

Engineering

Powered by: KNOWLGICA
KNOWLEDGE SOLUTIONS & TECH

Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالـــي
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.

- 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.

5. Assessment Results:

Chapter No.	Chapter Title	Intended Objectives	Assessment Type				
			Developed content/ Recorded Sessions	Practical Activities (Synchronized Sessions)	Quizzes and Exams	Presentations And Interviews	Reports
CH1	**Introduction to Distributed Systems**	Comprehension –Analytical Thinking –Tools and Application Hands– On	X	X	X	X	X
CH2	**Cloud Computing**	Comprehension –Analytical Thinking –Tools And Application Hands– On	X	X	X	X	X
CH3	**Inter–Process Communication (IPC)**	Comprehension –Analytical Thinking –Tools And Application Hands– On	X	X	X	X	X

CH4	**Time and Clocks in DS**	Comprehension –Analytical Thinking –Tools And Application Hands– On	X	X	X	X	X
CH5	**Coordination in DS**	Comprehension –Analytical Thinking –Tools And Application Hands– On	X	X	X	X	X

6. Course Syllabus

Chapter No.	Chapter Title	Chapter Content (Syllabus)	No. of Theoretical Learning Units	No. of Practical Learning Units)
CH1	**Introduction to Distributed Systems**	1. Definition of DS. 2. Main Characteristics. 3. Design Issues. 4. Types of DS.		
CH2	**Cloud Computing**	1. Key Characteristics. 2. Cloud Service Offering Types. 3. Cloud Computing Technologies. 4. Cloud Deployment Models.		
CH3	**Inter-Process Communication (IPC)**	1. Middleware. 2. Data Representation. 3. Remote Procedure Call (RPC). 4. Remote Method Invocation (RMI). 5. Distributed Software Examples.		
CH4	**Time and Clocks in DS**	1. Synchronization and Event Ordering. 2. Clock Synchronization Algorithms. 3. Physical Clock Synchronization Algorithms.	2	2

		4. Logical Clocks. 5. Lamport Algorithm. 6. Vector Algorithm.		
CH5	**Coordination in DS**	1. Mutual exclusion and Preliminaries 2. Design of Distributed Mutual Exclusion Algorithms. 3. The Central Coordination Algorithm 4. The Token Ring-Based Algorithm 5. Ricart-Agrawala Algorithm. 6. Quorum-Based Algorithms		

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.