Course Definition

Advanced Networks II

Information

Technology

Engineering

Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالـــي
Syrian Virtual University		الجامعة الافتراضية السورية

1. Basic Information:

Course Name	**Computer Networks II**
Course ID	**NNT601**
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
Computer Networks I, Operating Systems II	BNT501, NOS601

3. Course Objectives:

- To Define and explain the concept of routing in computer networks.
- To Identify the work of routers and their importance in the network.
- To Explain the types of routing within the domain and its most important protocols.
- To Explain the types of out-of-band routing and its most important protocols.
- To Describe the issue of network congestion and the control mechanisms used.
- To Identify the quality of services and the most important models used.

4. Learning Outcomes (LO):

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

- Mastery of the concepts of routing in networks, and understanding of related algorithms.

- Distinguishing between and explaining the types of routing used in both WANs and internets.

- Deep understanding of unicast, multicast, and broadcast routing.

- Understanding the issue of congestion in networks and the mechanisms to control it.

- Understanding Quality of Service (QoS) in networks and each of the two models of integrated services and differentiated services.

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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	Routing	Comprehension –Analytical Thinking –Tools and Application Hands– On	X	X	X	X	X
CH2	Advanced Routing	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X
CH3	Internetwork Routing	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X

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CH4	Congestion Control	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X
CH5	Quality of Services	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	Routing	1. The concept and types of routing in computer networks 2. Programmatically defined networks. 3. Router Functionality. 4. Distance Vector Protocol and (RIP) 5. Link State Protocol and (OSPF)		
CH2	Advanced Routing	1. Classification of networks according to sending destinations. 2. Broadcast routing and its basic algorithms. 3. Multicast routing and its different types. 4. DVMRP, MOSPF, PIM multicast algorithms.		
CH3	Internetwork Routing	1. Routing in WANs. 2. BGP Border Gateway Protocol. 3. Internet Group Management Protocol (IGMP). 4. Multicast Source Discovery Protocol		

		(MSDP). 5. Multicast Border Gateway Protocol (MBGP) 6. BGMP Border Gateway Multiplexing Protocol.		
CH4	Congestion Control	1. Concept of congestion and its reflection on networks. 2. Mechanisms of congestion handling at the network layer. 3. Shaping and Policing of traffic. 4. Active Queue Management ز 5. Random Early Detection (RED) Algorithm.	2	2
CH5	Quality of Services	1. Concept of quality of services in networks. 2. Types of traffic and their different requirements. 3. Techniques for providing quality service. 4. Types of scheduling 5. Integrated Services Model. 6. Differentiated Services Model.		

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7. Practical Activity:

- Tools and Labs:

Tool Name	Description

- Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	☒ Exercises ☒ Homework ☒ Webinars ☐ Project ☐ Experiment ☐ Other	
CH2	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	
CH3	☒ Exercises ☒ Homework ☐ Webinars ☐ Project	

	☐ Experiment	
	☐ Other	
CH4	☒ Exercises	
	☒ Homework	
	☐ Webinars	
	☐ Project	
	☐ Experiment	
	☐ Other	
CH5	☒ Exercises	
	☒ Homework	
	☐ Webinars	
	☐ Project	
	☐ Experiment	
	☐ Other	

8. References:

1- Computer Networks, Tanenbaum, Feamster and Wetherall, Sixth Edition, Pearson Education Limited, 2021.

2- Computer Networks: a system approach, Larry L. Peterson and Bruce S. Davie, Sixth Edition, 2022 Elsevier.