



الجامعة الافتراضية السورية
SYRIAN VIRTUAL UNIVERSITY

Course Definition File

Network Services

Information

Technology

Engineering



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1. Basic Information:

Course Name	Network Services
Course Code	NNS601
Number of Presentational Sessions*	20
Number of Synchronous Sessions**	10
Number of Shorter Tests***	2
Number of Exams***	1
Theoretical Sessions Work Load (hrs.)	60
Practical Sessions Work Load (hrs.)	30
Credit Hours	6

*Each presentational session comprises both recorded lecture (1.5 hrs.) and interactive learning content (1.5 hrs.).

**Each synchronous session comprises the interactive lecture carried out in real time in a virtual class (1.5 hrs.).

***Each shorter test is 0.5 hr. long. The final exam is 2 hrs. long.

N.B.

Generally, each chapter requires two presentational sessions: one for the recorded content and one for the interactive content (unless the chapter is too long, in which case it may require more sessions(This note applies to synchronous sessions as well, where each chapter requires one synchronous session generally.

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2. Prerequisites courses:

Course	Code
Computer Networks I	BNT501
Operating Systems II	NOS601

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3. Course Objectives:

The purpose of this course is to study the principles of network applications and some of the protocols used on the Internet that belong to the application layer according to the TCP/IP network model, and to identify the basic Internet services based on it.

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4. Learning Outcomes (LO):

Upon completion of the course, the student must be able to:

- Understanding the working mechanism of the basic services of the Internet such as e-mail service, web service, file transfer service, DNS. In addition, understanding the mechanism of work of peer-to-peer applications, video streaming networks and content distribution, creating network applications, and reviewing the most important functions offered by these services and applications, as well as understanding its technical dimension of the concepts and terminology and their settings.
- Learn about the general description of Internet protocols and understand how they work.
- Identify the data structure used for each service.
- Analyzing the data that passes through the network, and understanding the service or protocol that follows it.

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5. Assessment Results:

Chapter	Chapter Title	General Objectives	Assessment Type				
			Interactive Content & Recorded Sessions	Applied Activities (Synch. Sessions)	Final Exam*/ Shorter Tests**	Presentations and Interviews***	Reports ***
CH1	Principles of Network Applications	Comprehension – Analytical Thinking	X	X	X	X	X
CH2	The Web and HTTP	Comprehension – Analytical Thinking – Tools And Application Hands – On	X	X	X	X	X
CH3	Electronic Mail in the Internet	Comprehension Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X
CH4	DNS—The Internet’s Directory Service	Comprehension – Analytical Thinking – Tools And	X	X	X	X	X

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		Application Hands – On					
CH5	Peer – to – Peer Applications	Comprehension – Analytical Thinking – Application Hands – On	X	X	X	X	X
CH6	Video Streaming and Content Distribution Networks	Comprehension – Analytical Thinking – Tools And Application Hands – On	X	X	X	X	X
CH7	Socket Programmin g: Creating Network Applications	Comprehension – Analytical Thinking – Tools And Application Hands – On	X	X	X	X	X

*The final exam is two hours long and is given at the end of the course.

**Shorter tests are about 30 minutes long and are given after three or four lectures throughout the semester during synchronous sessions.

***Presentations, interviews, and reports are submitted once after each three or four lectures throughout the semester during synchronous sessions.

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6. Course Syllabus:

Chapter	Subject	Content	Number of Learning Objects	Number of synchronous Learning Objects
CH1	Principles of Network Applications	<ol style="list-style-type: none"> 1. Network Application Architectures 2. Processes Communicating 3. Transport Services Available to Applications 4. Transport Services Provided by the Internet 5. Application–Layer Protocols 	5	2
CH2	The Web and HTTP	<ol style="list-style-type: none"> 1. Overview of HTTP 2. Non–Persistent and Persistent Connections 3. Components of HTTP–based systems 4. HTTP Message Format 5. User – Server Interaction: Cookies 6. Web Caching 7. HTTP Hands–on 	7	3
CH3	Electronic Mail in the Internet	<ol style="list-style-type: none"> 1. SMTP 2. Comparison with SMTP 	8	4

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		<ol style="list-style-type: none"> 3. Mail Message Formats 4. Basic SMTP commands 5. Mail Access Protocols 6. Modern SMTP 7. Port Used by SMTP 8. Example of an SMTP session 		
CH4	DNS – The Internet’s Directory Service	<ol style="list-style-type: none"> 1. Services Provided by DNS 2. Overview of How DNS Works 3. DNS Records and Messages 4. Hands-on about querying any DNS server specified for a DNS record 	4	2
CH5	Peer-to-Peer Applications	<ol style="list-style-type: none"> 1. Historical development 2. Architecture P2P 3. Security and trust P2P 4. Distributed storage and search 5. Features, Advantages and Disadvantages of P2P network 6. P2P File Distribution 7. Scalability of P2P Architectures 8. BitTorrent 9. Setting up your own P2P network using python 	9	4
CH6	Video Streaming and Content	<ol style="list-style-type: none"> 1. What is streaming? 2. Protocols used in streaming 3. What factors slow down streaming? 4. Internet Video 	9	4

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	Distribution Networks	<p>5. HTTP Streaming and DASH</p> <p>6. Content Distribution Networks</p> <p>7. Case Studies: Netflix, YouTube, and Kankan</p> <p>8. Benefits and challenges of video streaming</p> <p>9. Video Streaming using Python</p>		
CH7	Socket Programming: Creating Network Applications	<p>1. Client/Server connection</p> <p>2. Socket Programming with UDP</p> <p>3. Socket Programming with TCP</p>	3	1

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7. Practical Activity:

- Tools and Labs:

Tool Name	Description
nmap	Network inventory, managing services
Wireshark	Network analysis tool
Python Language	For programming
C/C++ Language	For programming
Java Language	For programming

- Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars	
CH2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars <input type="checkbox"/> Project <input checked="" type="checkbox"/> Other	
CH3	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars	

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	<input type="checkbox"/> Project <input type="checkbox"/> Other	
CH4	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH6	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH7	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input checked="" type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	

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8. References:

1. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach", Pearson Education, Inc., 7th, 2017.