



## Course Specification of Computer Networks

Course No ( ..... )

2020/2021

Head of Department	Vise Dean for Qulity Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
Rector of Sana'a University			
Prof. Dr. Qassim Mohammed Abbas			



I. Course Identification and General Information:						
1	Course Title:	Computer Networks				
2	Course Code & Number:					
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2	--	2	--	
4	Study level/ semester at which this course is offered:	2 <sup>nd</sup> Year- 2 <sup>nd</sup> Semester -				
5	Pre –requisite (if any):	Introduction to Computer				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Computer Science, Information Technology, Information Systems				
8	Language of teaching the course:	English/Arabic				
9	Study System	Term Based System				
10	Mode of delivery:	Full Time				
11	Location of teaching the course:	Faculty of Computer and Information Technology				
12	Prepared By:	Dr. Sharaf Alhomdy				
13	Date of Approval					

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



## II. Course Description:

This course primarily aims to acquaint the student with basic concepts of computer and communication networking technologies. The topics includes the Internet, Protocols, Standards, networking architecture, OSI reference model & Internet Model (TCP/IP protocols), Transmission media, Data encoding/framing, error detection and correction, Flow control, Error control, Ethernet, Network layer protocols (IPv4 , IPv6) and wireless network fundamentals. Lab work focuses on basic information of network operating systems and implement simulation experience using packet trace simulator.

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
<b>Rector of Sana'a University</b> Prof. Dr. Qassim Mohammed Abbas			



III. Course Intended learning outcomes (CILOs)		Referenced PILOs
a.1	Demonstrate deep knowledge of OSI & TCP/IP Models and different types of networking.	A3
a.2	Explain the various concept of data communication and techniques such as transmission media, data encoding/framing, error detection and correction, DLL protocols, IPv4, IPv6, TCP, UDP and routing and addressing.	
b.1	Explore the network requirements of components, transmissions medium and communication protocols to meet desired need.	B1
b.2	Compare between OSI model & TCP/IP protocols .	B2
c.1	Employ the various concept of data communication, techniques tools and equipment to build or simulate a small network with acceptable levels of simplification.	C1 , C4
c.2	Implement different scenarios of computer network using simulation tools (packet trace or OPNET).	
d.1	Work effectively as a member of a group or individually to accomplish a common goal.	D1

**(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>a1-</b> Demonstrate deep knowledge of OSI & TCP/IP Models and different types of networking.	Lecture Discussion	Mid term exam Final exam Homework

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



a2-Explain the various concept of data communication and techniques such as transmission media, data encoding/framing, error detection and correction, DLL protocols, IPv4, IPv6, TCP, UDP and routing and addressing.	Lecture	Mid term exam
	Discussion	Final exam
		Homework

Head of Department	Vise Dean for Qulity Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
<b>Rector of Sana'a University</b> Prof. Dr. Qassim Mohammed Abbas			



**(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>b1-</b> Explore the network requirements of components, transmissions medium and communication protocols to meet desired need.	Lecture Seminar/Presentation	Written examinations, Assignments Problem-solving exercise.
<b>b2-</b> Compare between OSI model & TCP/IP protocols .	Lecture Seminar Exercises Group discussions Problem-solving	

**© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>c1-</b> Implement different scenarios of computer network using simulation tools (packet trace or OPNET).	Lab sessions Exercises Group discussions Problem-solving.	Written examinations (lab). Individual and group project work.
<b>c2-</b> Employ the various concept of data communication, techniques tools and equipment to build or	Interactive lecture Lab sessions	Written examinations.

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



simulate a small network with acceptable levels of simplification.	Exercises Group discussions problem-solving	Technical or practical reports /Presentations.  Individual and group project work.
--	---	--

**(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>d1-</b> Work effectively as a member of a group or individually to accomplish a common goal.	Guided individual reading.  Group discussions Seminar/presentation	Technical reports  Presentations.

**IV. Course Content:**

**A – Theoretical Aspect:**

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction	a1, b1	<ul style="list-style-type: none"> <li>- Review on topology</li> <li>- Define Data communication and network</li> <li>- Type of networks (LAN, MAN, WAN)</li> <li>- the Internet history</li> <li>- define protocols and Standards</li> <li>- Circuit switching and Packet switching and the difference between them</li> </ul>	1	2
2	Network Models	a1, a2, b2, c1	<ul style="list-style-type: none"> <li>- OSI model (7 layer model, functions of layers)</li> <li>- TCP/IP protocol suite</li> <li>- Comparing the OSI model and TCP/IP model</li> </ul>	2	4

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



3	Transmission Media	a2, b1, c2	<ul style="list-style-type: none"> <li>- Guided Media ( Twisted-pair cable, Coaxial cable, Fiber optic cable)</li> <li>- Unguided Media (Radio waves, Microwaves, Infrared, leaser )</li> <li>- Different type of antenna</li> </ul>	1	2
4	Data Link Layer	a2, b1, c2, d1	<ul style="list-style-type: none"> <li>- Types of errors</li> <li>- Error detection and correction</li> <li>- Coding technique</li> <li>- Using Hamming Distance</li> <li>- Combining Hamming Distance and Interleaving</li> <li>- Framing</li> </ul>	2	4
6	Data Link Layer	a1, a2, b1, b2, c2	<ul style="list-style-type: none"> <li>- Flow and error control ( Flow control, Error control, Flow and error control mechanism)</li> <li>- Stop-and-wait ARQ</li> <li>- Go-back-n ARQ</li> <li>- Selective repeat ARQ</li> <li>- HDLC</li> </ul>	1	2
7	Local Area Networks	a1, b2, c2	<ul style="list-style-type: none"> <li>- Traditional Ethernet</li> <li>- Fast Ethernet</li> <li>- Gigabit Ethernet</li> <li>- Bridging.</li> </ul>	1	2
8	Network layer protocols	a2, b1, b2, c1, c2	<ul style="list-style-type: none"> <li>- ARP ( Mapping, Packet Format, Encapsulation, Operation)</li> <li>- TCP and UDP protocol</li> <li>- IPv4 (Datagram, Fragmentation)</li> <li>- IPv4 ADDRESSES ( Classful Addressing , Classless Addressing, Network Address Translation, Subnetting address)</li> <li>- ICMP (Types of messages)</li> <li>- IGMP protocol</li> <li>- SSL protocol</li> <li>- IPv6 ( IPv6 addresses, Categories of addresses, IPv6 packet format, Fragmentation, ICMPv6</li> <li>- Transition from IPv4 to IPv6)</li> </ul>	4	8
9	Wireless Network	a1, b1, c2	Introduction to WI-FI	1	2

Head of Department	Vise Dean for Qulity Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas





10	Review and project discussion	a1, a2, b1, b2, c2, d1	Project discussion	1	2
Number of Weeks /and Units Per Semester				14	28

B - Practical Aspect: (if any)				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	-Review on different topologies -Practice on cable and use equipment's to create or build small network with acceptable levels of simplification.	2	4	a1, b1, c1
2	-Install and use operating system such as window server or Linux. - Install simulation software.	2	4	b1, c1, d1
3	- Classes and subnetting -Divide the networks to subnetting -identify the IP Address.	2	4	a2, b2, c2, d1
4	Mid-term exam	1	2	a1, a2, b1, c1, c2
5	Implement different scenarios on computer network using simulation.	1	2	a2, b2, c1, d1
6	Use current techniques, skills, and tools necessary to simulate subnetting network .	3	6	b2, c2, d1

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



7	Training on configuration of hub/switch, wireless access point and protocols such as FTP, Tenet etc...	2	4	a2, b1, b2, c2, d1
8	Project discussions	1	2	a1, a2, b1, b2, c1, c2, d1
9	Final exam	1	2	a1, a2, b1, b2, c1, c2
Number of Weeks /and Units Per Semester		15	30	

## V. Teaching strategies of the course:

Lecture\Interactive lecture

Lab sessions

Exercises

Group discussions

problem-solving

Seminar/Presentation

Guided individual reading.

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Determine the requirements of building a different types of network.	a2, b1, c1	4 <sup>th</sup> to 8 <sup>th</sup>	5
2	Build different network scenarios using network simulation tools.	a2, b2, c2	4 <sup>th</sup> to 12 <sup>th</sup>	10

Head of Department

Vise Dean for Quality Assurance

Dean of the Faculty

Dean of Development center and Quality Assurance

Assoc. Prof. Mansour N. Ali

Dr. Anwar Al-Shamiri

Dr. Nagi Al-Shibani

Assoc. Prof. Dr. Huda Al.Emad

Rector of Sana'a University

Prof. Dr. Qassim Mohammed Abbas



3	Lab-reports	a2, b1, c2, d1	2 <sup>th</sup> , 4 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup>	5
	Total			20

## VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	2 <sup>th</sup> , 4 <sup>th</sup> to 12 <sup>th</sup>	20	20%	a2, b1, b2, c1, c2, d1
2	Mid-term exam (Lab)	7 <sup>th</sup>	5	5%	a2, b1, c1, c2
3	Mid-term exam (Theory)	7 <sup>th</sup>	10	10%	a1, a2, b1, b2, c2
4	Final exam (Lab)	15 <sup>th</sup>	5	5%	a1, a2, b1, b2, c1, c2
5	Final exam (Theory)	16 <sup>th</sup>	60	60%	a1, a2, b1, b2, c1, c2
	Total		100	100%	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

- 1- Behrouz A. Forouzan (2013), "Data Communications and Networking", 5/e McGraw-Hill Companies, Inc, ISBN: 0072967757.
- 2- James F. Kurose, Keith W. Ross, (2020), "Computer Networking: A Top-Down Approach", 7<sup>th</sup> Edition, ISBN-10: 0-321-49770--8, Addison-Wesley.

### 2- Essential References.

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr. Huda Al.Emad

### Rector of Sana'a University

Prof. Dr. Qassim Mohammed Abbas



- 1- Joseph Davies, ( 2012 ) “Understanding IPv6: Your Essential Guide to IPv6 on Windows Networks”, 3rd Edition, Microsoft Corporation, USA.
- 2- R. Perlman, “Interconnections, Bridges, Routers, Switches, and Internetworking *Protocols*”, Addison Wesley, 2nd edition.

### 3- Electronic Materials and Web Sites etc.

- 1- The Network Simulator - ns-2, <http://www.isi.edu/nsnam/ns/>
- 2- OPNET Modeler, [https://www.opnet.com/solutions/network\\_rd/modeler.html](https://www.opnet.com/solutions/network_rd/modeler.html)

## IX. Course Policies:

1	Class Attendance: - According to university rules that determine the attendance policy , the adoption of absence and how and when to deprive the student of maturity ( the student must attend at least 75% of the number of lectures ).
2	Tardy: - Late attendance is determined by the policy in cases of recurrences delayed depriving the student to attend some educational activities by the teacher.
3	Exam Attendance/Punctuality: - According to the university rules which determines attendance policy, delays and absence from the test
4	Assignments & Projects: - Determine the policies followed in cases of delay in submitted homework & projects and when it should be delivered to the teacher.
5	Cheating: - According to the university rules
6	Plagiarism: - According to the university rules
7	<b>Other policies:</b>  The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



Head of Department	Vise Dean for Qulity Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
Rector of Sana'a University			
Prof. Dr. Qassim Mohammed Abbas			



## Faculty of Computer & Information Technology

### Department of Computer Science

### Program of Computer Science

### Course Specification of Computer Networks

Course No ( ..... )

2020/2021

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University			
Prof. Dr. Qassim Mohammed Abbas			



I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:						
1	Course Title:	Computer Networks				
2	Course Code & Number:					
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2	--	2	--	3
4	Study level/ semester at which this course is offered:	2 <sup>nd</sup> Year- 2 <sup>nd</sup> Semester				
5	Pre –requisite (if any):	Introduction to Computer				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Computer Science, Information Technology, Information Systems				
8	Language of teaching the course:	English/Arabic				

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



9	Study System	Term Based System
10	Mode of delivery:	Full Time
11	Location of teaching the course:	Faculty of Computer and Information Technology

### III. Course Description:

This course primarily aims to acquaint the student with basic concepts of computer and communication networking technologies. The topics includes the Internet, Protocols, Standards, networking architecture, OSI reference model & Internet Model (TCP/IP protocols), Transmission media, Data encoding/framing, error detection and correction, Flow control, Error control, Ethernet, Network layer protocols (IPv4 , IPv6) and wireless network fundamentals. Lab work focuses on basic information of network operating systems and implement simulation experience using packet trace simulator.

### IV. Intended learning outcomes (ILOs) of the course:

- a1. Demonstrate deep knowledge of OSI & TCP/IP Models and different types of networking.
- a2. Explain various concept of data communication and techniques such as transmission media, data encoding/framing, error detection and correction, DLL protocols, IPv4, IPv6, TCP, UDP and routing and addressing.
- b1. Explore the network requirements of components, transmissions medium and communication protocols to meet desired need.
- b2. Compare between OSI model & TCP/IP protocols .
- c1. Employ the various concept of data communication, techniques tools and equipment to build or simulate a small network with acceptable levels of simplification.
- c2. Implement different scenarios of computer network using simulation tools (packet trace or OPNET).

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr. Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas





**d1.** Work effectively as a member of a group or individually to accomplish a common goal.

## V. Course Content:

### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours
1	Introduction	<ul style="list-style-type: none"> <li>- Topologies</li> <li>- Define Data communication and network</li> <li>- Type of networks (LAN, MAN, WAN)</li> <li>- the Internet history</li> <li>- define protocols and Standards</li> <li>- Circuit switching and Packet switching and the difference between them</li> </ul>	1 <sup>st</sup>	2
2	Network Models	<ul style="list-style-type: none"> <li>- OSI model (7 layer model, functions of layers)</li> <li>- <b>TCP/IP protocol suite</b></li> <li>- Comparing the OSI model and TCP/IP model</li> </ul>	2 <sup>nd</sup> , 3 <sup>th</sup>	4
3	Transmission Media	<ul style="list-style-type: none"> <li>- Guided Media ( Twisted-pair cable, Coaxial cable, Fiber optic cable)</li> <li>- Unguided Media (Radio waves, Microwaves, Infrared, leaser )</li> <li>- Different type of antenna</li> </ul>	4 <sup>th</sup>	2
4	Data Link Layer	<ul style="list-style-type: none"> <li>- Types of errors</li> <li>- Error detection and correction</li> <li>- Coding technique</li> <li>- Using Hamming Distance</li> <li>- Combining Hamming Distance and Interleaving</li> <li>- Framing</li> </ul>	5 <sup>th</sup> , 6 <sup>th</sup>	4
5	Mid-term Exam	- Exam	7 <sup>th</sup>	2
6	Data Link Layer	<ul style="list-style-type: none"> <li>- Flow and error control ( Flow control, Error control, Flow and error control mechanism)</li> <li>- Stop-and-wait ARQ</li> <li>- Go-back-n ARQ</li> <li>- Selective repeat ARQ</li> <li>- HDLC</li> </ul>	8 <sup>th</sup>	2

Head of Department

Vise Dean for Quality Assurance

Dean of the Faculty

Dean of Development center and Quality Assurance

Assoc. Prof. Mansour N. Ali

Dr. Anwar Al-Shamiri

Dr. Nagi Al-Shibani

Assoc. Prof. Dr. Huda Al.Emad

Rector of Sana'a University

Prof. Dr. Qassim Mohammed Abbas



7	Local Area Networks	<ul style="list-style-type: none"> <li>- Traditional Ethernet</li> <li>- Fast Ethernet</li> <li>- Gigabit Ethernet</li> <li>- Bridging.</li> </ul>	9 <sup>th</sup>	2
8	Network layer protocols	<ul style="list-style-type: none"> <li>- ARP ( Mapping, Packet Format, Encapsulation, Operation)</li> <li>- TCP and UDP protocol</li> <li>- IPv4 (Datagram, Fragmentation)</li> <li>- IPv4 ADDRESSES ( Classful Addressing , Classless Addressing, Network Address Translation, Subnetting address)</li> <li>- ICMP (Types of messages)</li> <li>- IGMP protocol</li> <li>- SSL protocol</li> <li>- IPv6 ( IPv6 addresses, Categories of addresses, IPv6 packet format, Fragmentation, ICMPv6)</li> <li>- Transition from IPv4 to IPv6)</li> </ul>	10 <sup>th</sup> - 13 <sup>th</sup>	8
9	Wireless Network	Introduction to WI-FI	14 <sup>th</sup>	2
10	Review and project discussion	Project discussion	15 <sup>th</sup>	2
11	Final Exam	Exam	16 <sup>th</sup>	2
Number of Weeks /and Units Per Semester			16	32

### B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Week Due	contact hours
1	<ul style="list-style-type: none"> <li>-Review on different topologies</li> <li>-Practice on cable and use equipment's to create or build small network with acceptable levels of simplification.</li> </ul>	1 <sup>st</sup> , 2 <sup>nd</sup>	4

Head of Department	Vise Dean for Qulity Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



2	-Install operating system such as window server or Linux. - Install simulation software.	3 <sup>rd</sup> ,4 <sup>th</sup>	4
3	- Classes and subnetting -Divide the networks to subnetting -identify the IP Address.	5 <sup>th</sup> ,6 <sup>th</sup>	4
4	<b>Mid-term exam</b>	7 <sup>th</sup>	2
5	Implement different scenarios on computer network using simulation.	8 <sup>th</sup>	2
6	Use current techniques, skills, and tools necessary to simulate subnetting network .	9 <sup>th</sup> -11 <sup>th</sup>	6
7	Training on configuration of hub/switch, wireless access point and protocols such as FTP, Tenet etc...	12 <sup>th</sup> ,13 <sup>th</sup>	4
8	Project discussions	14 <sup>th</sup>	2
9	<b>Final exam</b>	15 <sup>th</sup>	2
<b>Number of Weeks /and Units Per Semester</b>		<b>15</b>	<b>30</b>

## VI. Teaching strategies of the course:

Lecture\Interactive lecture

Lab sessions

Exercises

Group discussions

problem-solving learning

Seminar/Presentation

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



Guided individual reading

## VII. Assignments:

No	Assignments	Week Due	Mark
1	Determine the requirements of building a different types of network..	4 <sup>th</sup> to 8 <sup>th</sup>	5
2	Build different network scenarios using network simulation tools.	4 <sup>th</sup> to 12 <sup>th</sup>	10
3	Lab-reports	2 <sup>th</sup> , 4 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup>	5
	Total		20

## VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	2 <sup>th</sup> , 4 <sup>th</sup> to 12 <sup>th</sup>	20	20%
2	Mid-term exam (Lab)	7 <sup>th</sup>	5	5%
3	Mid-term exam (Theory)	7 <sup>th</sup>	10	10%
4	Final exam (Lab)	15 <sup>th</sup>	5	5%
5	Final exam (Theory)	16 <sup>th</sup>	60	60%
	Total		100	100%

Head of Department

Vice Dean for Quality Assurance

Dean of the Faculty

Dean of Development center and Quality Assurance

Assoc. Prof. Mansour N. Ali

Dr. Anwar Al-Shamiri

Dr. Naji Al-Shibani

Assoc. Prof. Dr. Huda Al-Emad

Rector of Sana'a University

Prof. Dr. Qassim Mohammed Abbas



## IX. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

- 1- Behrouz A. Forouzan (2013), "Data Communications and Networking", 5/e McGraw-Hill Companies, Inc, ISBN: 0072967757.
- 2- James F. Kurose, Keith W. Ross, (2020), "Computer Networking: A Top-Down Approach", 7<sup>th</sup> Edition, ISBN-10: 0-321-49770--8, Addison-Wesley.

### 2- Essential References.

- 1- R. Perlman, "Interconnections, Bridges, Routers, Switches, and Internetworking Protocols", Addison Wesley, 2nd edition.
- 2- Joseph Davies, ( 2012 ) "Understanding IPv6: Your Essential Guide to IPv6 on Windows Networks", 3rd Edition, Microsoft Corporation, USA.

### 3- Electronic Materials and Web Sites etc.

- 1- The Network Simulator - ns-2, <http://www.isi.edu/nsnam/ns/>
- 2- OPNET Modeler, [https://www.opnet.com/solutions/network\\_rd/modeler.html](https://www.opnet.com/solutions/network_rd/modeler.html)

## X. Course Policies:

1	Class Attendance: - According to university rules that determine the attendance policy , the adoption of absence and how and when to deprive the student of maturity ( the student must attend at least 75% of the number of lectures ).
2	Tardy: - Late attendance is determined by the policy in cases of recurrences delayed depriving the student to attend some educational activities by the teacher.
3	Exam Attendance/Punctuality: - According to the university rules which determines attendance policy, delays and absence from the test
4	Assignments & Projects: - Determine the policies followed in cases of delay in submitted homework & projects and when it should be delivered to the teacher.
5	Cheating:

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad

**Rector of Sana'a University**  
Prof. Dr. Qassim Mohammed Abbas



	- According to the university rules
6	Plagiarism: - According to the university rules
7	<b>Other policies:</b>  The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

اللجنة الإشرافية			
م.	الاسم	الصفة	التوقيع
١	أ.م.د. عبد الماجد الخليدي	نائب عميد الكلية للشؤون الأكاديمية	
٢	أ.م.د. احمد مجاهد	نائب عميد مركز التطوير الأكاديمي وضمان الجودة	
٣	د. حسين الأشول	ممثل المركز في الكلية	
٤	أ.د. إبراهيم المطاع	نائب رئيس الجامعة للشؤون الأكاديمية	

Head of Department	Vise Dean for Quality Assurance	Dean of the Faculty	Dean of Development center and Quality Assurance
Assoc. Prof. Mansour N. Ali	Dr. Anwar Al-Shamiri	Dr. Nagi Al-Shibani	Assoc. Prof. Dr.Huda Al.Emad
<p style="text-align: right;"><b>Rector of Sana'a University</b> Prof. Dr. Qassim Mohammed Abbas</p>			